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2002/2004

REPORTS

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RESEARCH INSTITUTE OF THE HUNGARIAN
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YEAR

2002–2004

NAGYCENK GEOFYSICAL OBSERVATORY



SOPRON

2006

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IAGA CODE: NCK

Editor

V. Wesztergom

Technical editor

J. Szendrői

Contributors/Authors

P. Bencze	K. Kovács	G. Sători
J. Bór	I. Lemperger	J. Verő
Á. Kis	F. Márcz	Á. Wallner
A. Koppán	T. Prodán	V. Wesztergom

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2006
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Felelős kiadó: Dr. Závoti József

director

Sopron, Csatkai E. u. 6-8.

Tel.: +36-99-508-350

Hillebrand Nyomda Kft.

Sopron, Csengery u. 51.

Tel.: +36-99-333-800

Fax.: +36-99-330-900

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Preface

The Széchenyi István Geophysical Observatory of the Hungarian Academy of Sciences is pleased to present the 2002–2004 report in the Geophysical Observatory Report series.

Nagycenk Geophysical Observatory has been supplying data since 1957. Geophysical Observatory Reports comprise earth current data from 1957 on, geomagnetic data from 1961 on and atmospheric electricity data from 1962 on.

Further information and data including archived data are available by special arrangement at the institute:

Geodetic and Geophysical Research Institute

Earth Science Centre

Hungarian Academy of Sciences

H-9401 Sopron

P.O.Box 5

Phone: +36–99–508340

Fax: +36–99–508355

e-mail: wv@ggki.hu

Sopron, November 2006

V. Wesztergom

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I. DESCRIPTION OF THE OBSERVATORY

V. WESZTERGOM

Nagyecenk Geophysical Observatory was founded in 1956–1957 and it has been operated since then by the Geodetic and Geophysical Institute of the Earth Science Center, Hungarian Academy of Sciences.

The observatory is situated about 10 km to E of the city Sopron and 60 km SE of Vienna, on the southern shore of lake Fertő. The observatory lies on thick conductive sediment preserving the site from far industrial noise and it is surrounded by the Fertő-Hanság National Park which helps to shelter the long term measurements from any change caused by nearby manmade activity.

The co-ordinates of the observatory

3-character IAGA code: **NCK**

Geographic co-ordinates:

φ = 47°38' (N)

λ = 16°43' (E)

Altitude = 153.70 m (magnetic house)

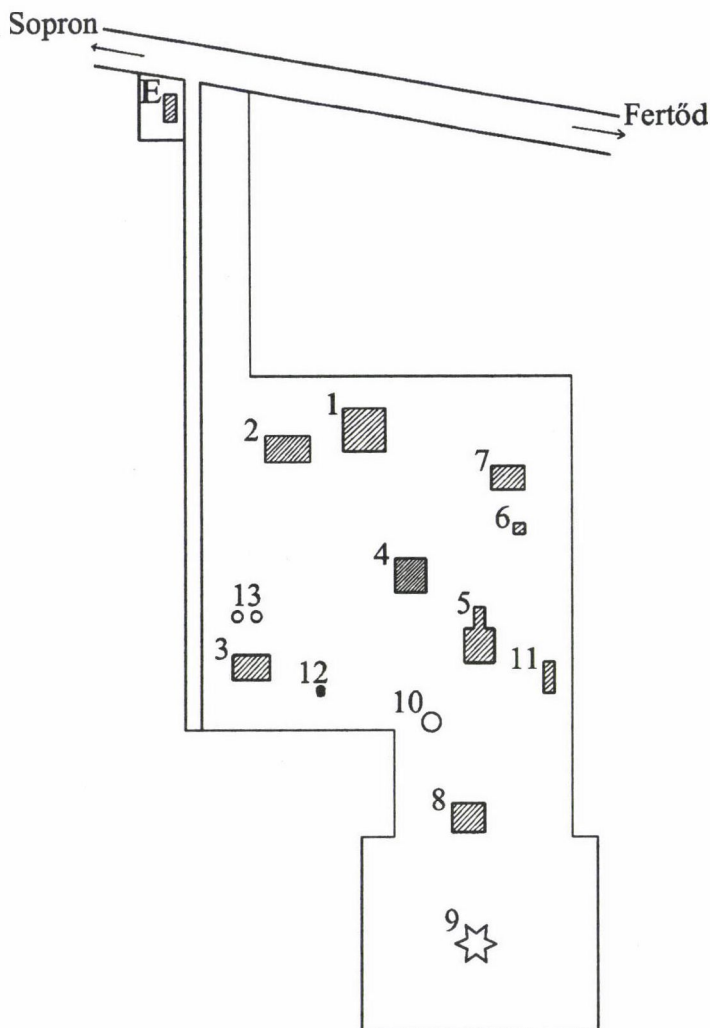
McIllwain L = 1.9

Measurements and reports started in 1957 (International Geophysical Year) with earth current data. The potential differences are measured in N-S and E-W directions with electrode spacings of 500 m. Low polarization lead plate electrodes are buried about 2 m below the surface. Potential differences are recorded with 1 sec and 10 sec sampling rate.

Continuous observation of atmospheric electricity started in 1962. Slow variation (DC component of vertical atmospheric electric field) is measured between the ground and an electrode (at 1 m height) around which the potential is equalized by means of a radioactive collector. Potential gradient is recorded with 15 sec sampling rate.

The publication of point discharge data has been abandoned from the year 2002.

Table I. Observatory site diagram



E – Entrance, 1 – Main building with staff hostel and electronic laboratory, 2 – Telluric instruments and office, 3 – Atmospheric electricity centre (laboratory of Schumann resonance, potential gradient, point discharge and radiowave absorption measurements), 4 – Magnetic absolute house with four pillars, 5 – Underground magnetic variometer chambers, 6 – Proton magnetometer (DI/DD) hut, 7 – Computer centre (data loggers, server of local network, satellite transmitter) 8 – Ionosonde station, electric and mechanical workshop, 9 – Ionosonde D-antenna, 10 – Meteorological station, 11 – ELF induction coil chamber, 12 Ball antenna (Schumann resonance antenna), 13 – Potential gradient sensors

Continuous observation of geomagnetic elements with control of the absolute observations began in 1961. The observatory has belonged to the INTERMAGNET co-operation since 1993. Data are transmitted via METEOSAT satellite to geomagnetic information nodes and made also available to the international research community on CD ROM.

The early nineties are to be considered as a transition period in the observatory again. Schumann resonance measurements started in 1993, an ionosonde station type IPS 42 works since 1996 and a scientific meteorological station was installed in 1996. The meteorological station is based on a Campbell CR10X measurement and control modul, temperature, humidity, wind speed, wind direction, rainfall and radiation sensors.

II. GEOMAGNETISM

ELECTRIC ACTIVITY INDICES

The 3-hour electric activity indices T for the E_x and E_y component, have a linear scale with a step of 1.8 mV/Km. The range of values is 0 to 9.

Values in brackets mean extrapolated data, where the lacking intervals were substituted by the average of recorded intervals.

Times are given in CET (i.e. UT + 1 h), nearly corresponding to LT (−7 min).

A detailed description of the processing and compilation is found in the Report of the Observatory for 1966 in German and *Ádám A, Verő J, Cz. Miletits J, Holló L, Wallner Á: The geophysical observatory near Nagycenk. I. Electromagnetic measurements and processing of data (Acta Geod. Geoph. Mont. Hung., 16, 1981, 333).*

See CD (program Seenck.exe, menu item Tellurics/Indices).

Date	T	Sum	Date	T	Sum
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020124	01111100	5	020306	22353135	24
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MAGNETIC MEASUREMENTS AND DATA PROCESSING

V. WESZTERGOM

Recording of geomagnetic variations

Geomagnetic variations are recorded by the ARGOS system. ARGOS (developed by the Geomagnetism Group of British Geological Survey) is a PC based automatic observatory equipped with triaxial fluxgate and a proton magnetometer in a DD/DI configuration. The fluxgate variometer sensors are aligned in X, Y, Z directions. 10 second samples are used to provide minute values centred on the minute by means of a 7-point cosine filter. Reported elements are: H (horizontal), Z (vertical), D (declination) and F (total force). From the year 1993 on the minute values are transmitted through the METEOSAT satellite to the Edinburgh Geomagnetic Information Node.

Table I. Main specifications of ARGOS used in Nagycenk Observatory

Device	Resolution	Dynamic range	Temperature coeff.
Triaxial Fluxgate			
Magnetometer	0.1 nT	± 500 nT/ ± 400 nT	~ 1 nT/ $^{\circ}\text{C}$
Proton Magnetometer			
(ELSEC 820)	0.1 nT	10000–90000 nT	–

DI/DD coil system consists of two orthogonal sets of Helmholtz coils (proton head is mounted at the centre). Coils orientated so that one provides bias fields approximately perpendicular to F vector in the magnetic meridian and the other provides bias fields approximately perpendicular to F in the horizontal plane. DD and DI relative to the initial values (D_0 , I_0) are calculated. DD/DI proton magnetometer is used in every tenth minutes from which F and almost absolute values of D and I are obtained.

Satellite transmitter, 6800 Series of Data Collection Platform, was supplied by Space Technology Systems. Power output to antenna (two linearly-polarised Yagi arranged to give circular polarisation) is 4 watts at 402 MHz. Data storage capacity is 2×40 kbytes.

Timing is produced by the IBM clock corrected by the high stability crystal built in the Proton Magnetometer.

To ensure continuous recording a high stability torsion photoelectric magnetometer (type PSM-8711) has been run from 1 January 1998. Data along with telluric data are logged by a DR-02 type digital recording system. The PSM magnetometer records the H, D and Z component with an exceptionally high parameter stability. The baseline variation has never exceeded 1.5 nT/year. Maximum resolution is 3 pT, sampling rate applied is 10 s. Frequency response: 0.3 Hz to DC. Sensitivity to tilting: less than 10 nT/'.

Data are stored in the internal memory of the digital data logger DR-02. Both the PSM and the DR-02 was developed and provided by the Institute of Geophysics Polish Academy of Sciences.

Absolute control, baselines

Baselines of the variometer systems are derived from absolute observations. Prior to 1989 the baseline was controlled by two QHM, one declinometer and one BMZ. From 1989 till the end of 1994 the standard instrument for absolute measurements was the vector proton magnetometer (NVP) constructed in Niemegk Observatory. In 1994 an Overhauser proton magnetometer (type: GSM 19 of GEM Systems) and a fluxgate theodolite (developed by the Danish Meteorological Institute) was purchased. Since then the standard instruments are the fluxgate theodolite for I and D and the Overhauser effect proton magnetometer for F.

To determine the momentary angle of declination four observations (four null positions in the horizontal plane) are taken and it is repeated at least two times. Generally the closer azimuth mark is used but it is checked regularly with the far azimuth mark. Inclination angle is determined in the plain of the momentary magnetic meridian in the same way as D. Total intensity is measured simultaneously with I-measurements on the next (F) pillar with the Overhauser magnetometer. Absolute values of all geomagnetic elements are referred to the same pillar of the absolute hut. Observation is made weekly, occasionally more often.

Absolute measurements are supplemented by quasi absolute baseline reference measurements. Declination, inclination and total intensity are determined by means of a proton vector magnetometer in every ten minutes.

Data processing and availability

Sampling rate of magnetic variation data is 10s both for ARGOS and PSM. Minute mean values are produced with digital filter from the raw sampled data. According to the IAGA recommendation minute mean values are stored. Hourly means are calculated from minute means, yearly means are derived from hourly means. Final absolute values of H, D and Z field component are obtained from smoothed baselines.

ARGOS data are compared continuously to PSM data and gaps are filled.

Data are logged on floppy disk too. In addition to logging data to disk INTER-MAGNET V2.8 format satellite transmission packets are sent to DCP.

Presentation of the results

- plot of hourly mean values of H, D, Z
- plot of daily mean values of H, D, Z
- tables of geomagnetic activity indices, K
- table of annual mean values of geomagnetic elements
- special phenomena: SSC, sfe

See CD (program Seenck.exe, menu item Magnetics).

GEOMAGNETIC DATA

Hourly mean values of H, D, Z and F

Hourly means are derived from minute means corrected using absolute observations. The units of the elements are 0.1 nT, Declination is also scaled to 0.1 nT. Minute means of F are calculated from H and Z. F values are checked by comparing them with proton magnetometer readings taken at every 10 minutes.

Daily mean values of H, D, Z and F

Daily mean values are calculated from hourly mean values.

Geomagnetic activity indices: K-index

The K-index is determined from the amplitude ranges of H and D components for each three-hour Universal Time interval. Limit for K=9 is 350 nT in Nagycenk.

Special phenomena

List of special events is based on both magnetic and earth current records. Tables are given for SSC-s and sfe.

Annual mean values of geomagnetic elements

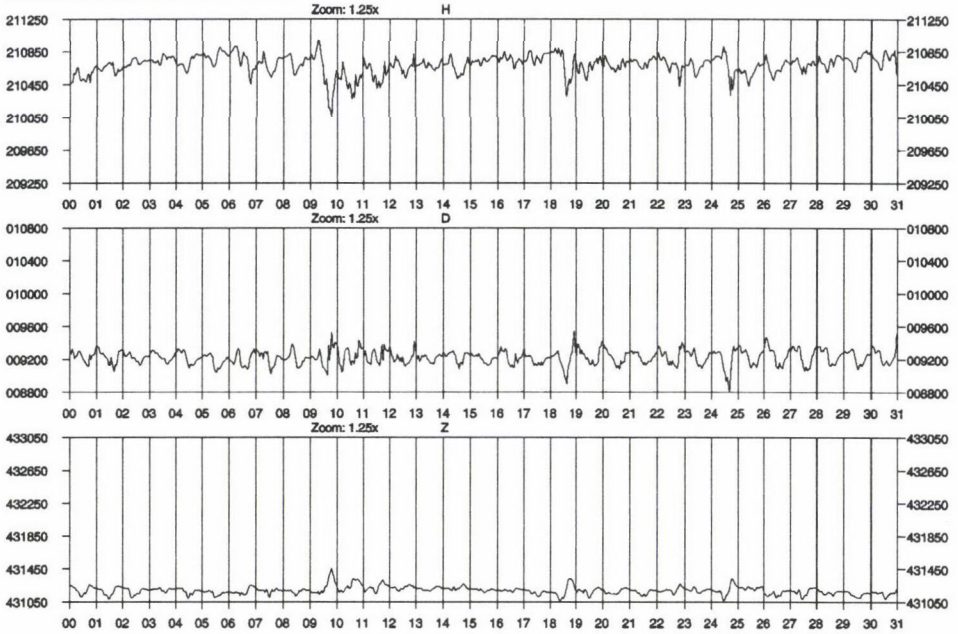
Table contains yearly means of the geomagnetic elements 1961 to 1993 in nT. These values are the results of a reevaluation of previously published data, including corrections eliminating disturbances caused by construction works in the observatory. Corrected values are noted by asterisk.

Times in this section are given in UT!

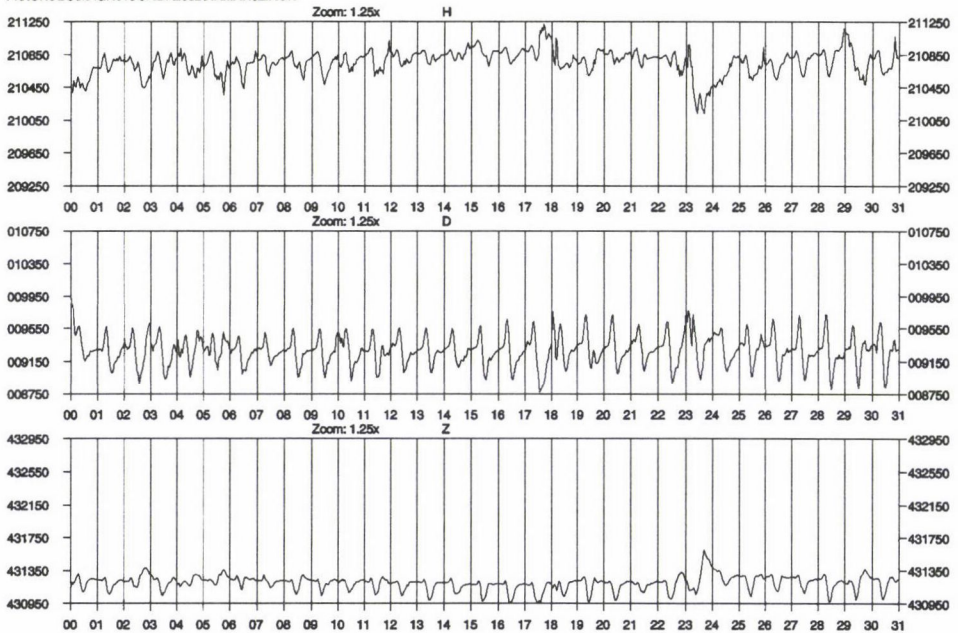
See CD (program Seenck.exe, menu item Magnetics).

Hourly mean values of H, D, Z
2002-2004

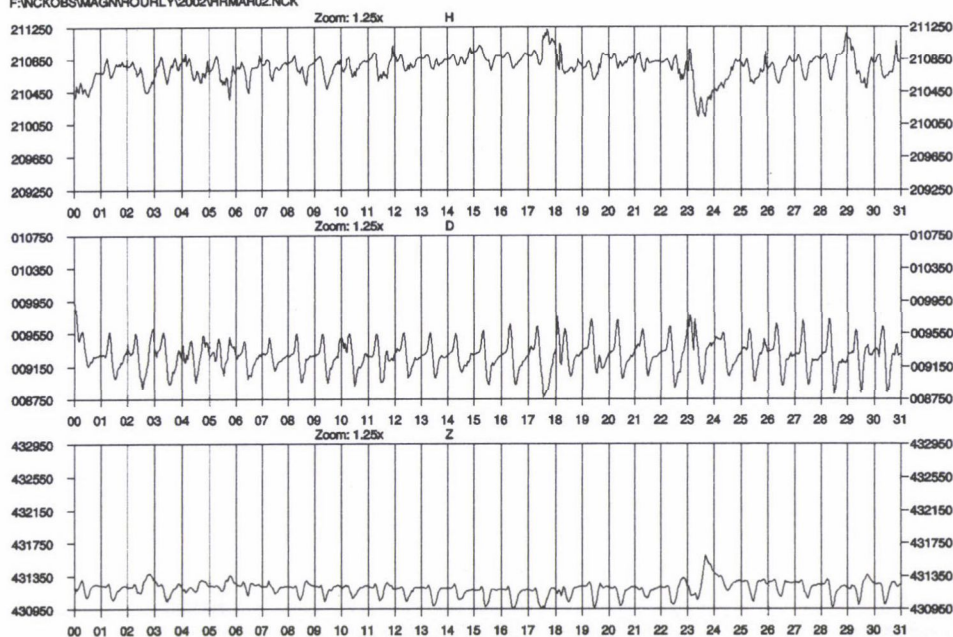
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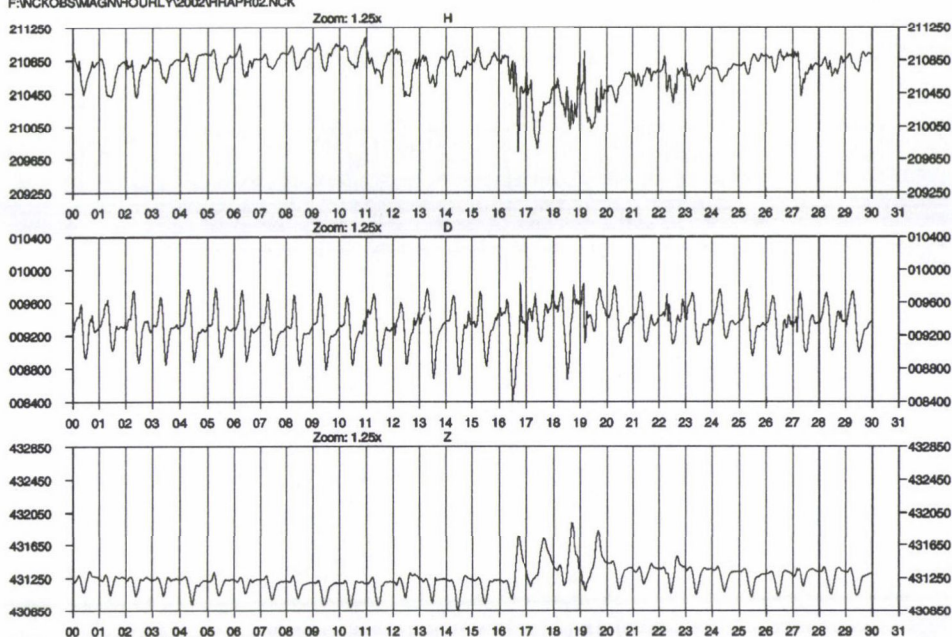
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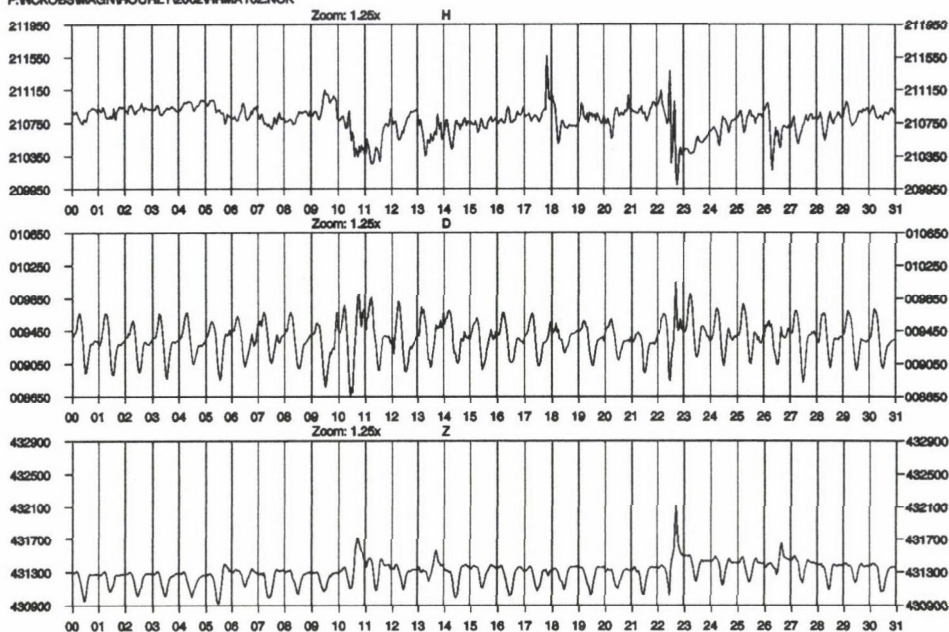
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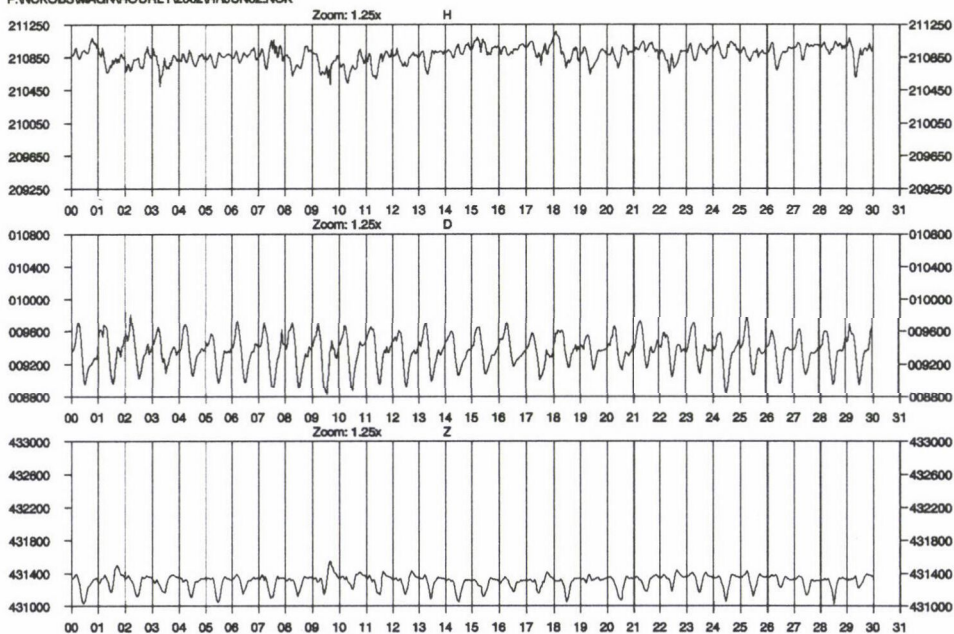
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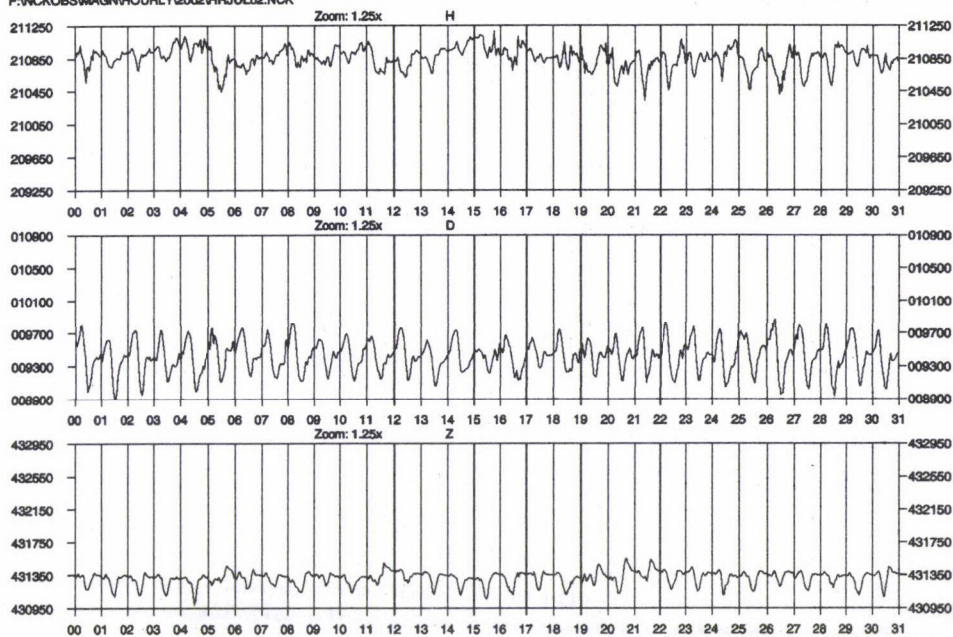
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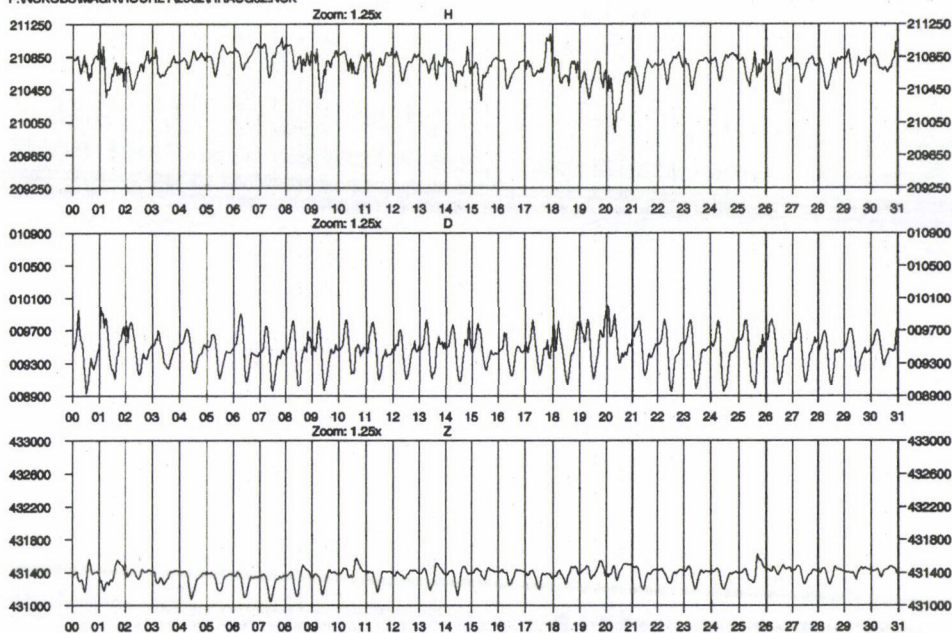
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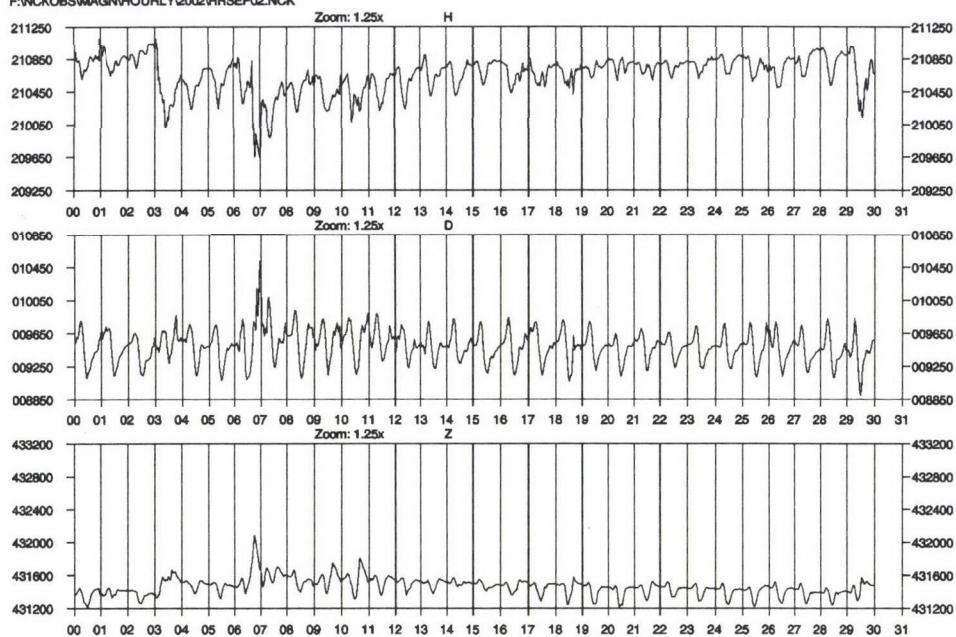
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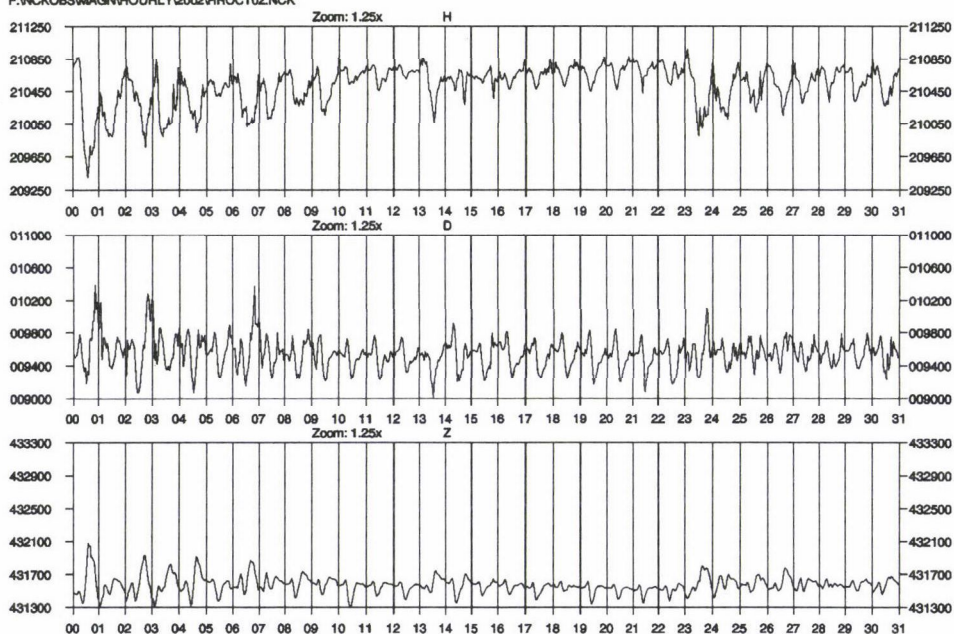
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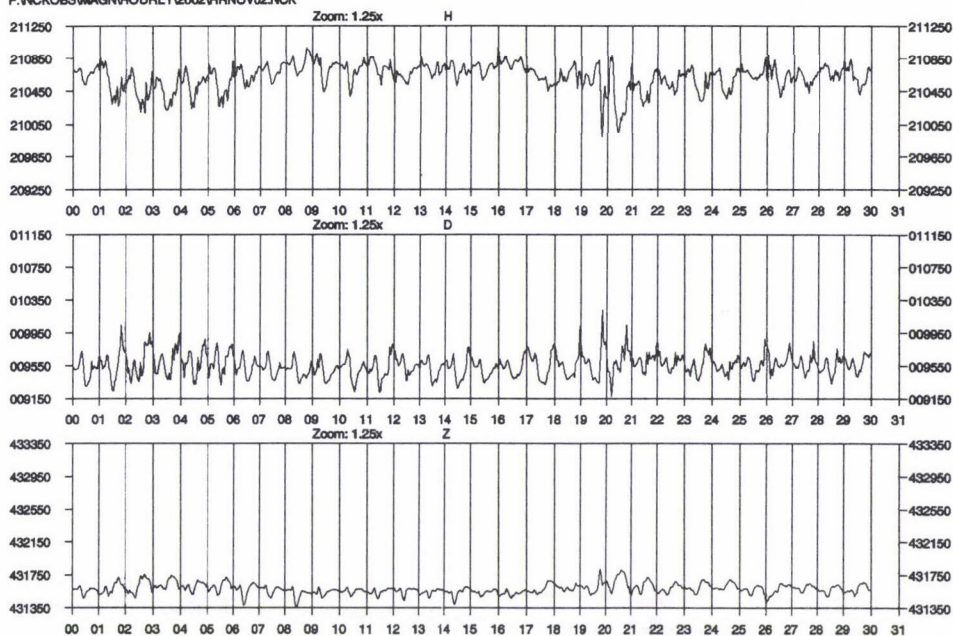
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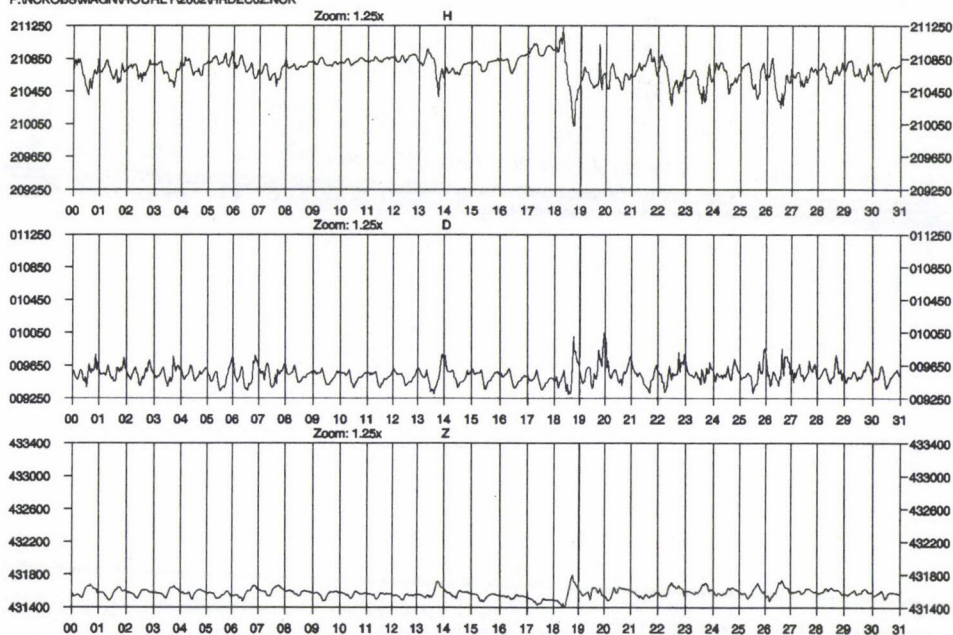
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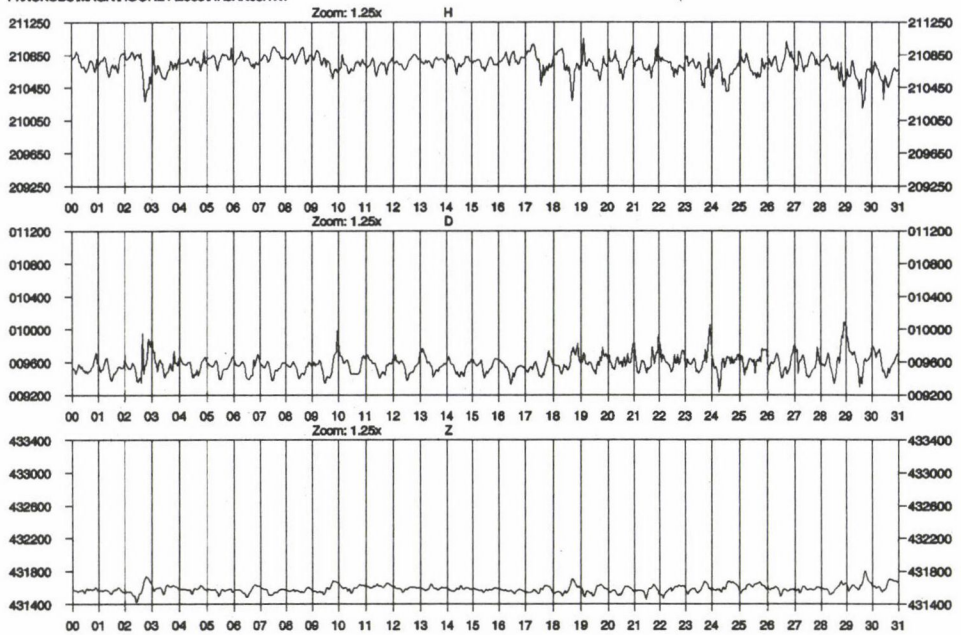
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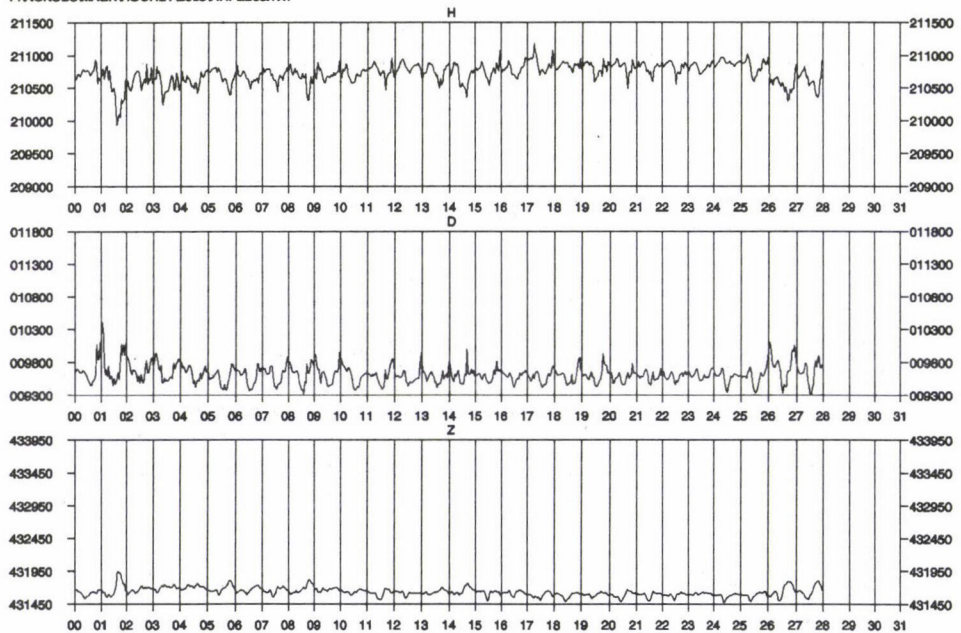
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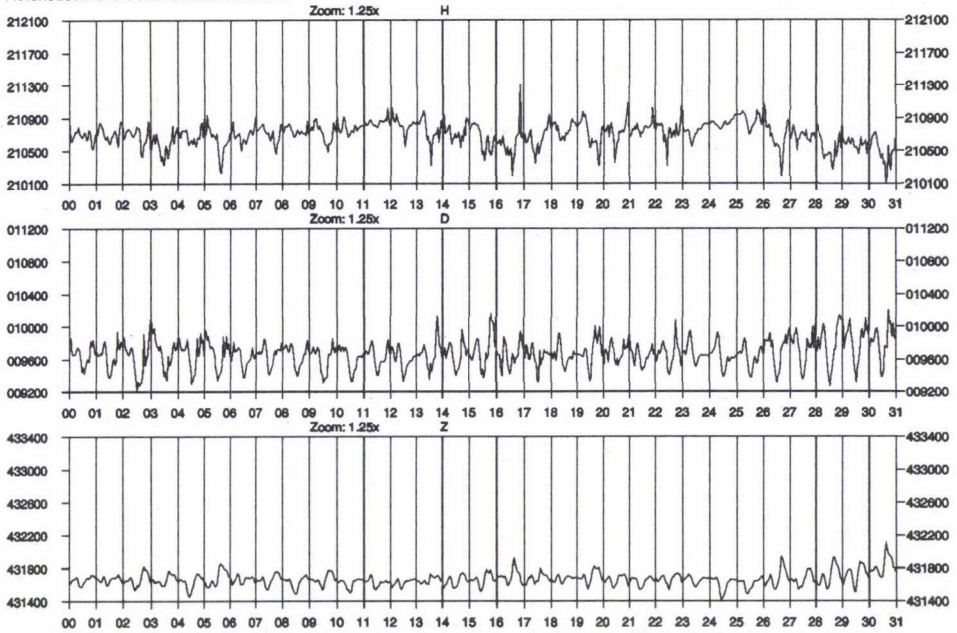
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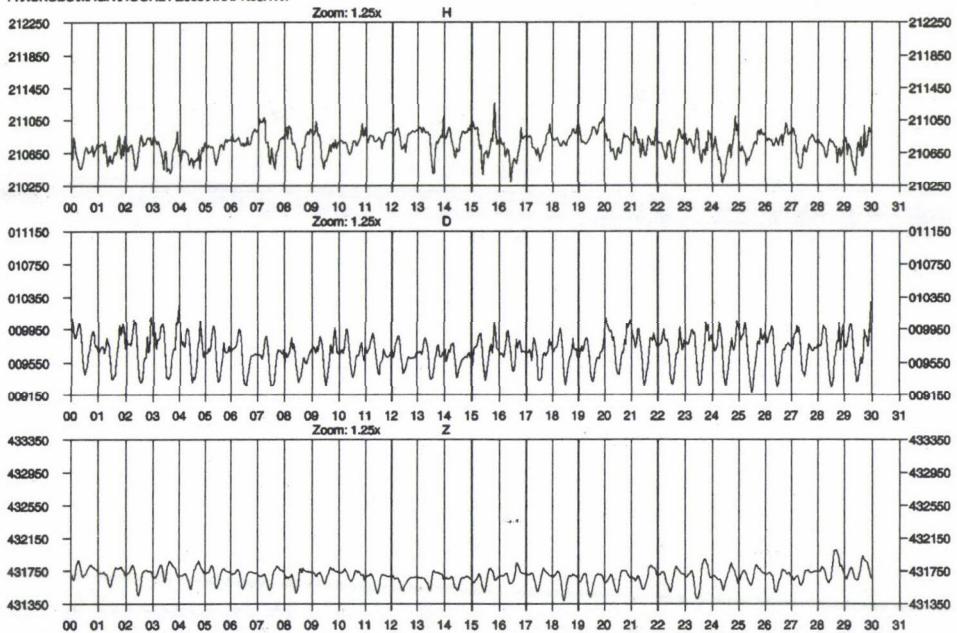
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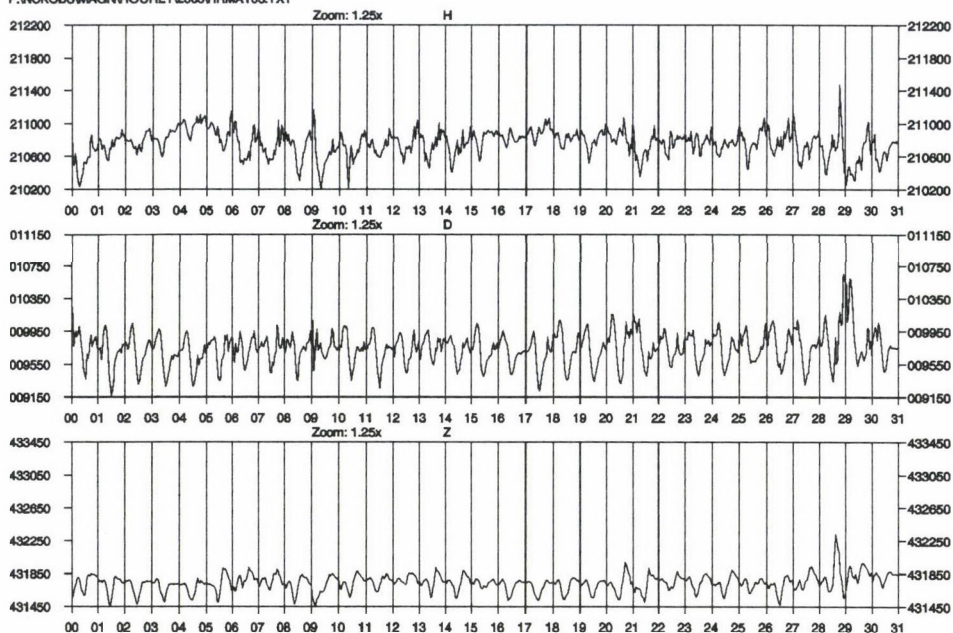
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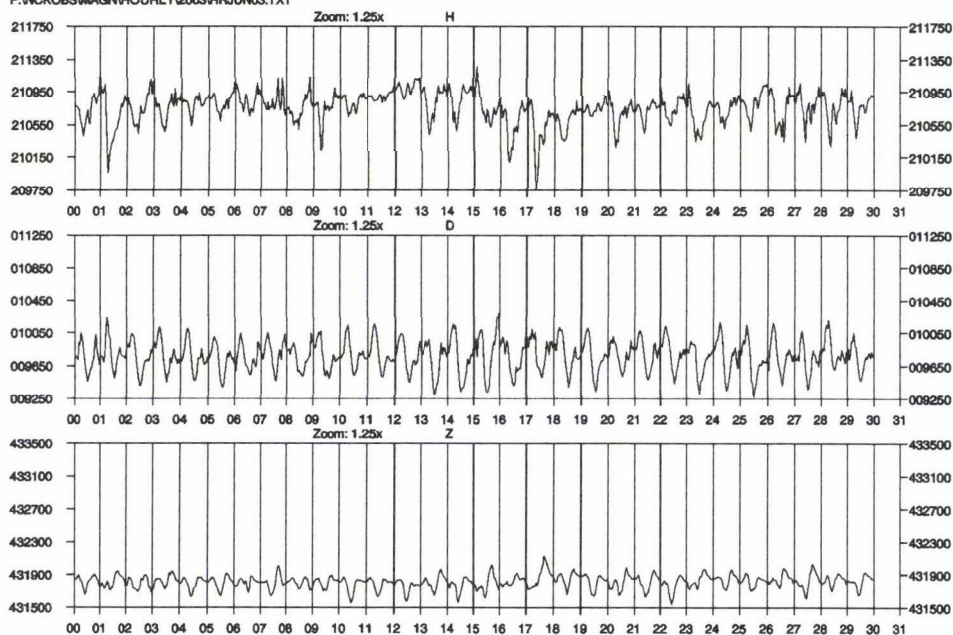
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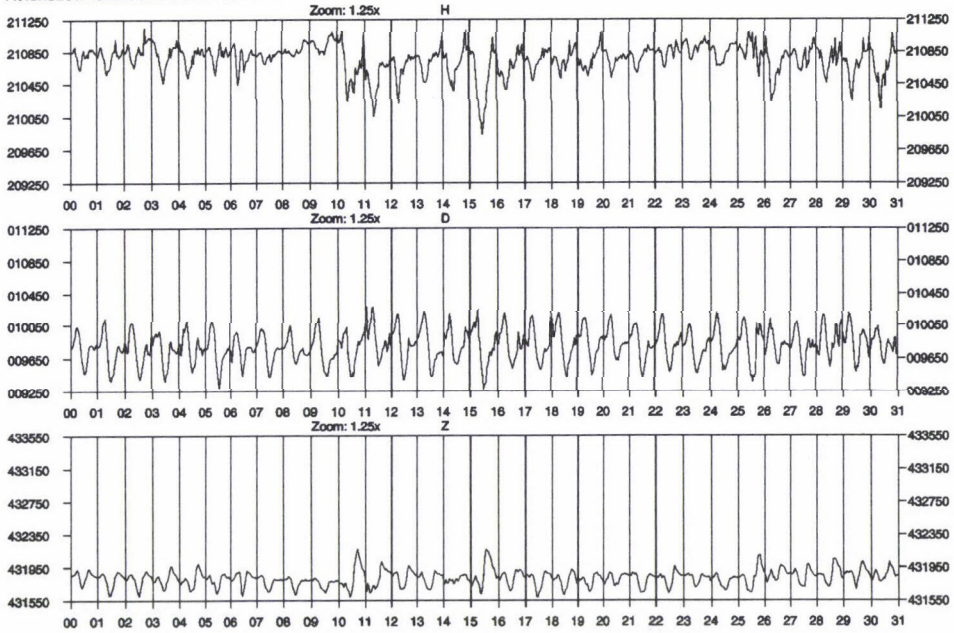
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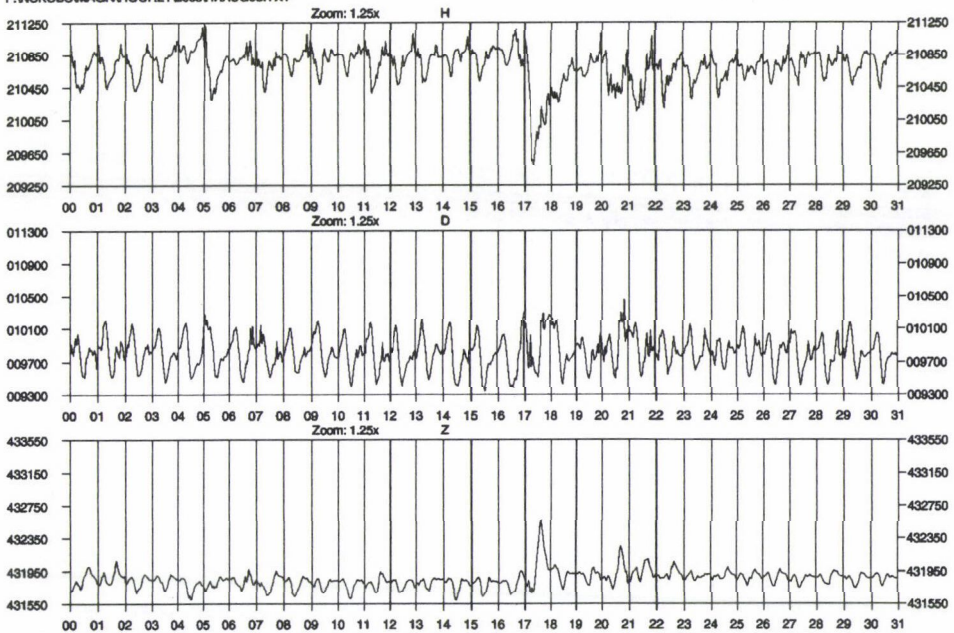
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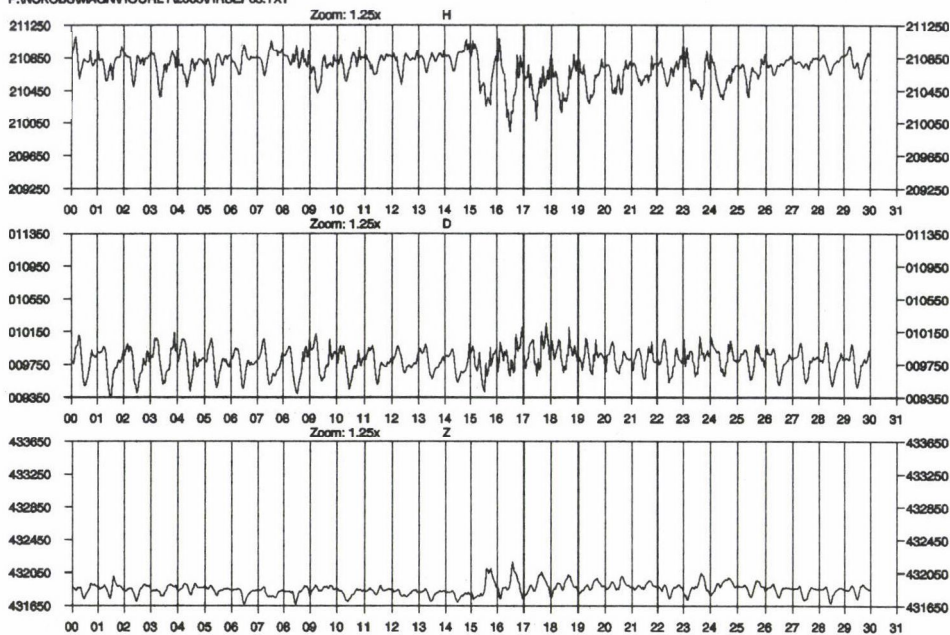
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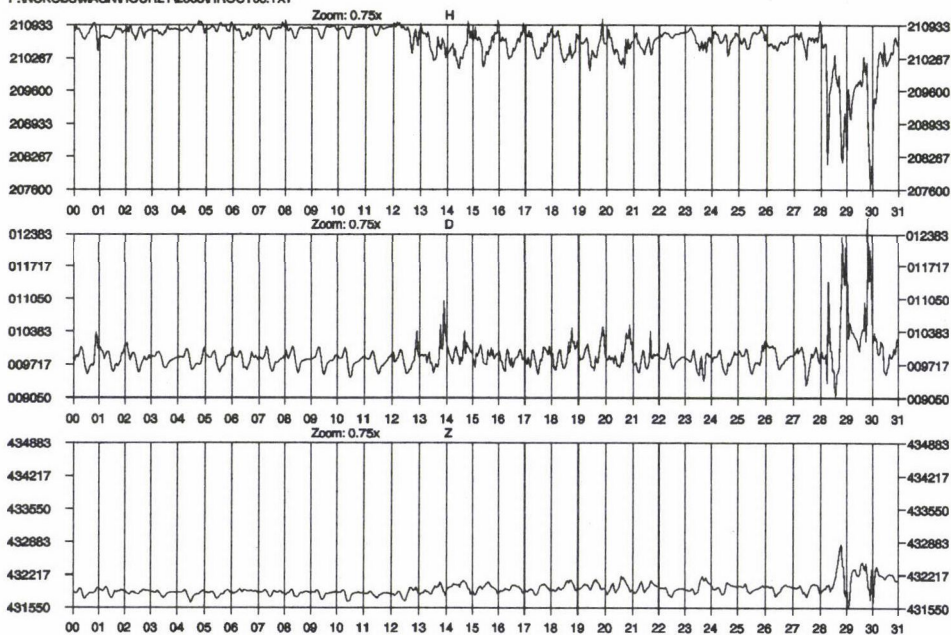
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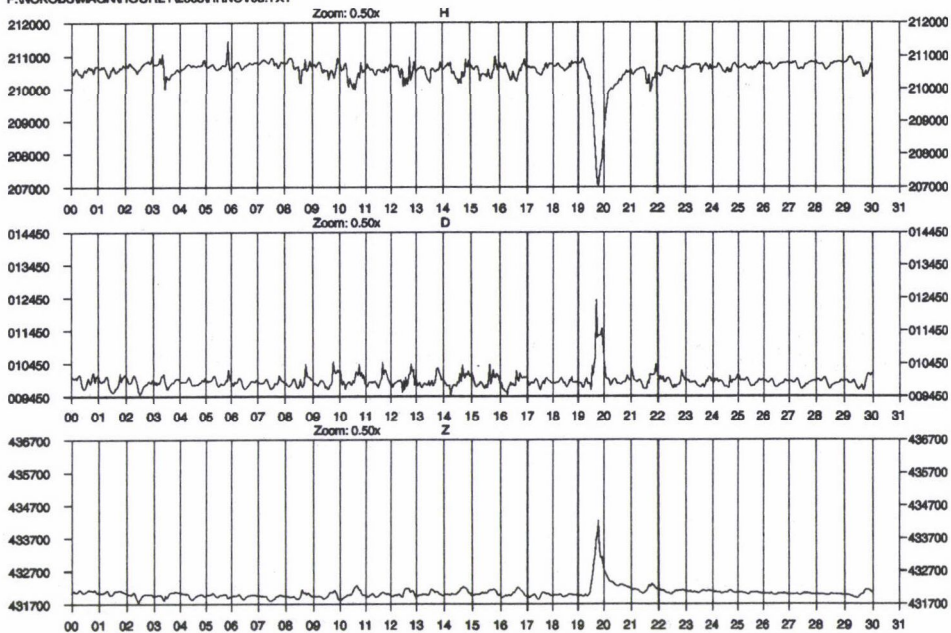
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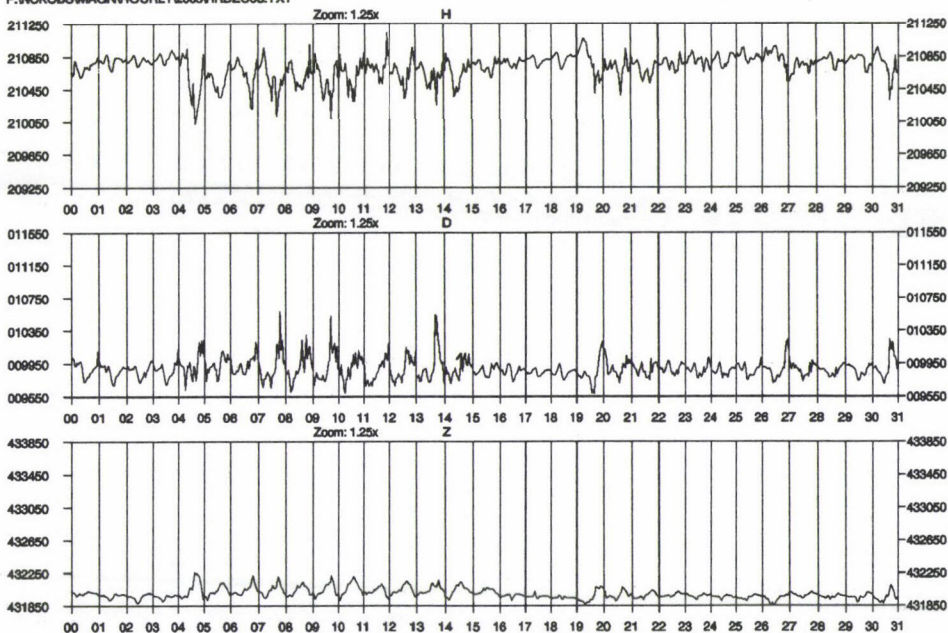
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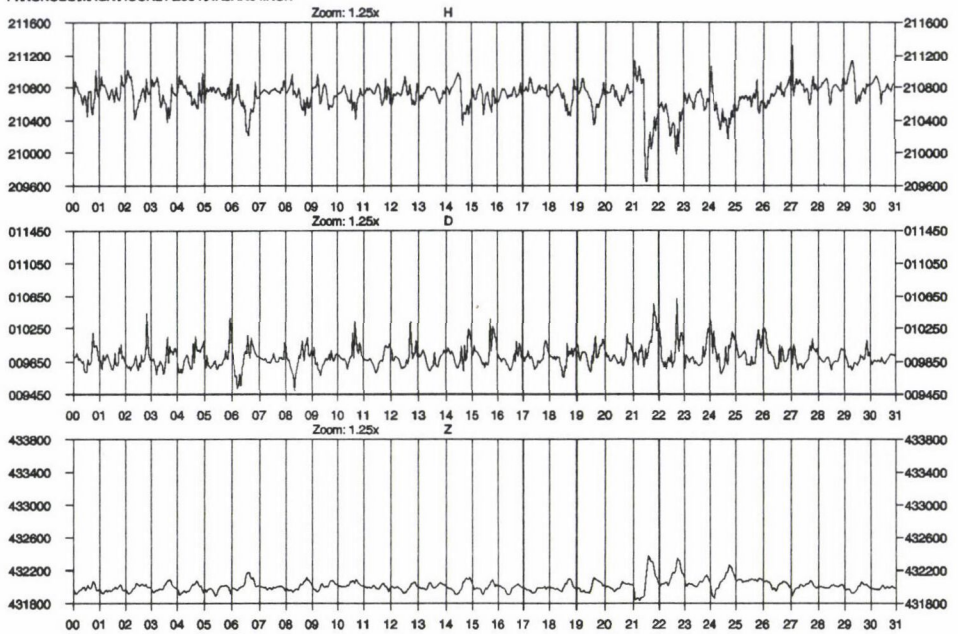
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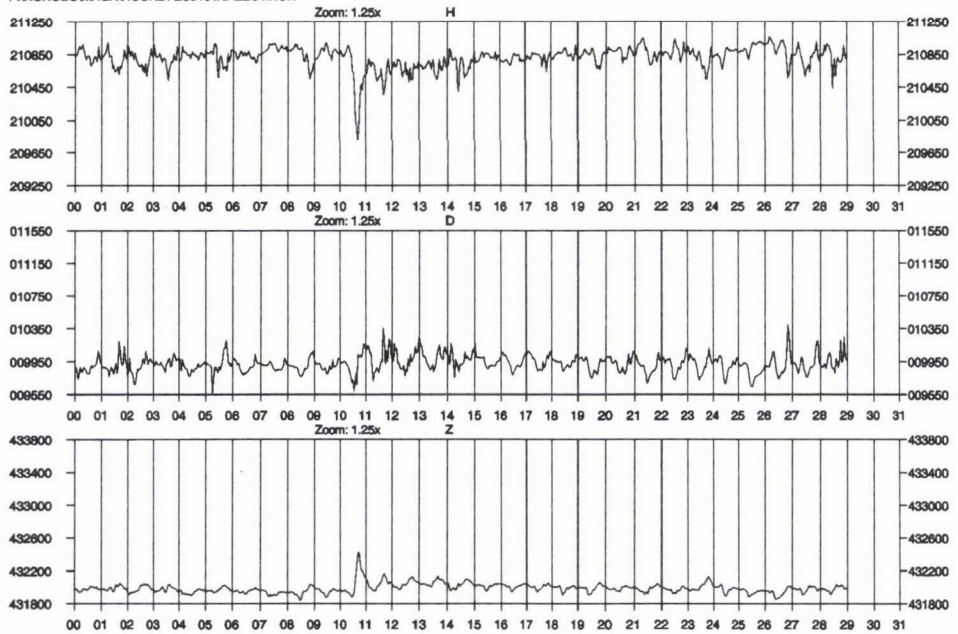
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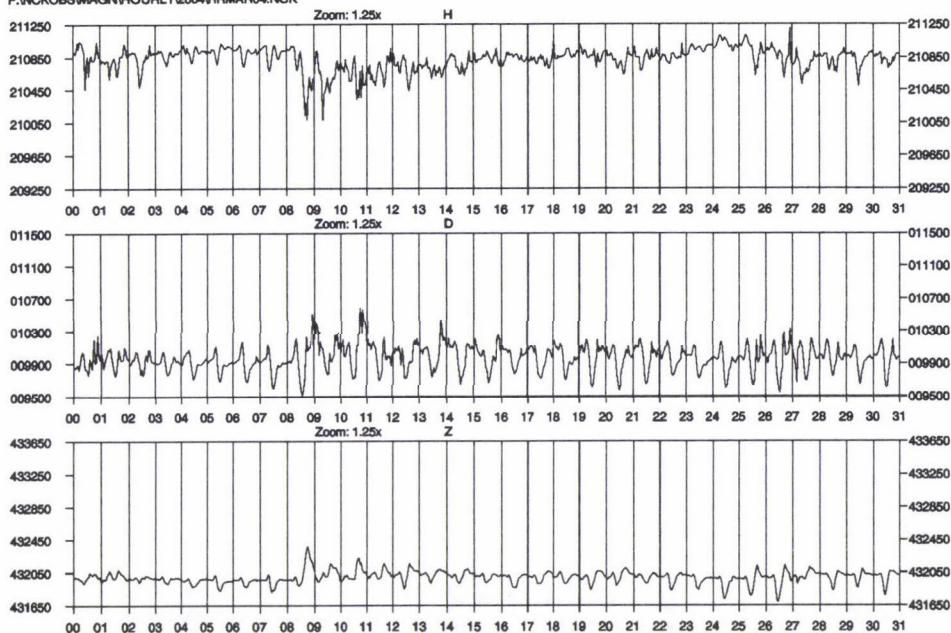
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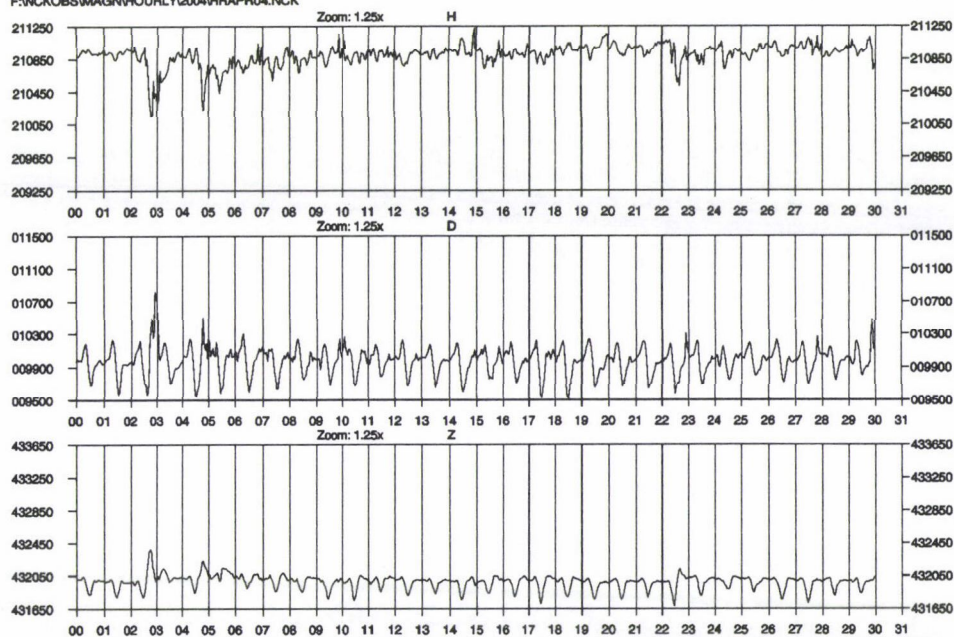
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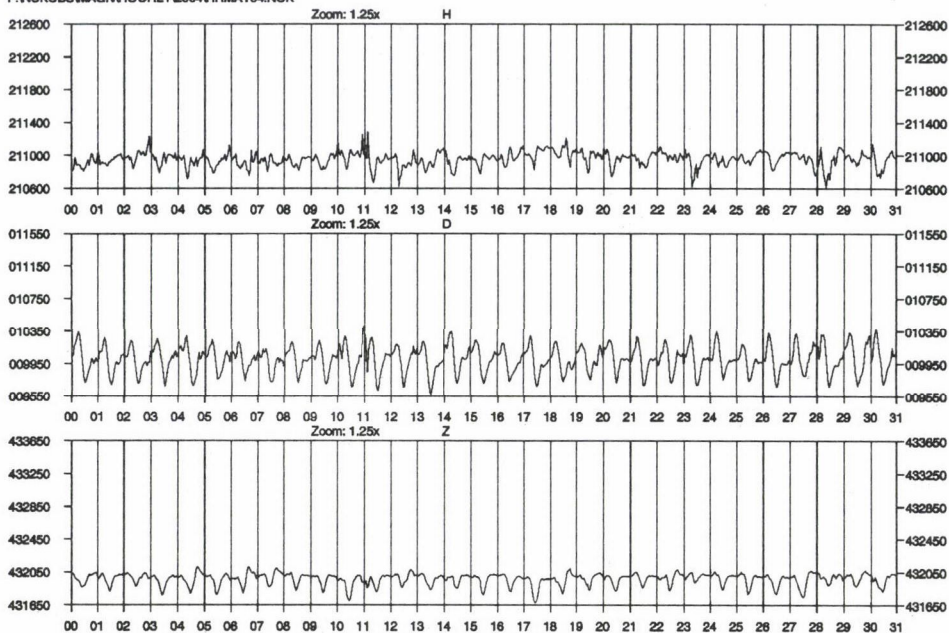
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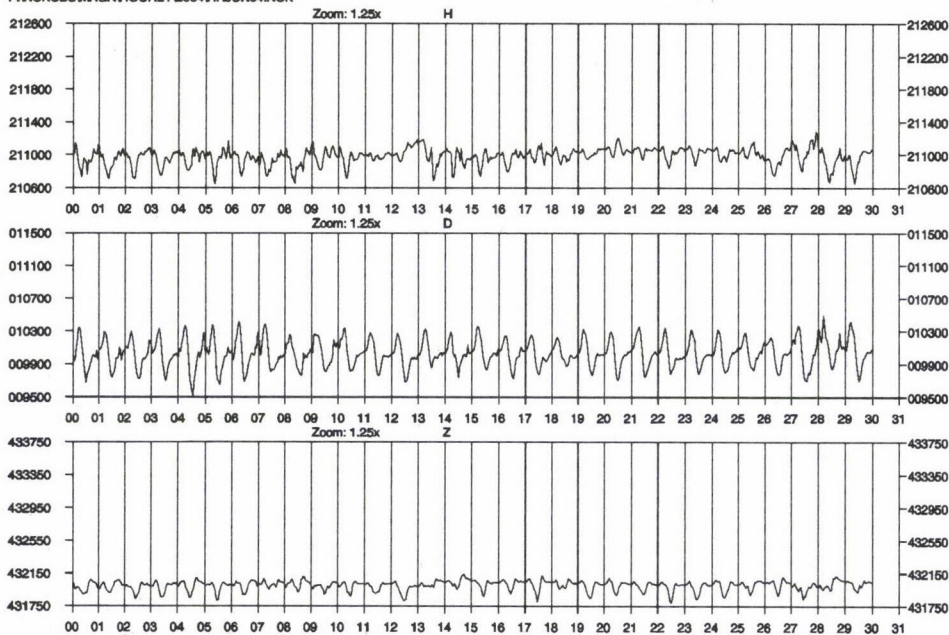
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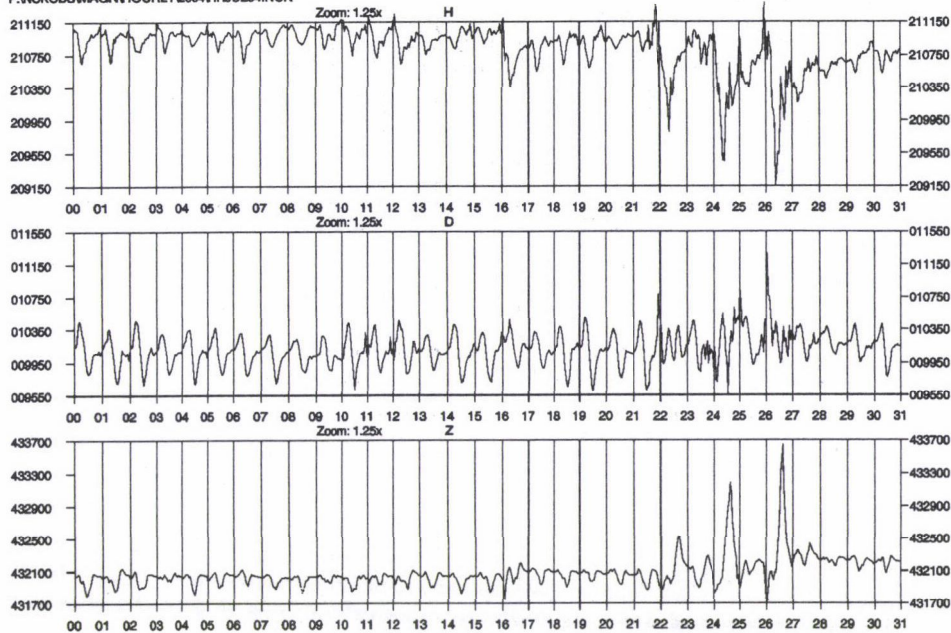
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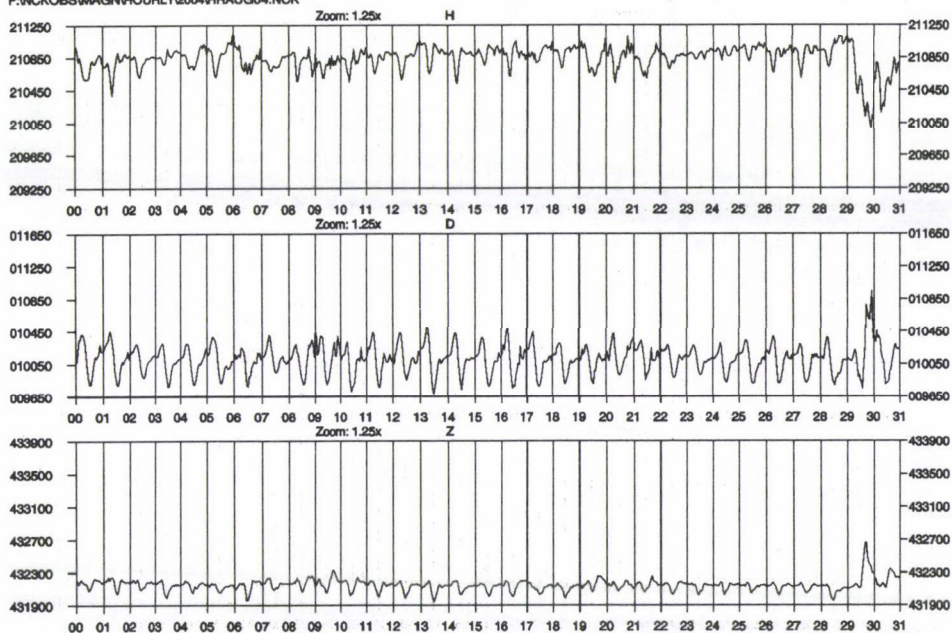
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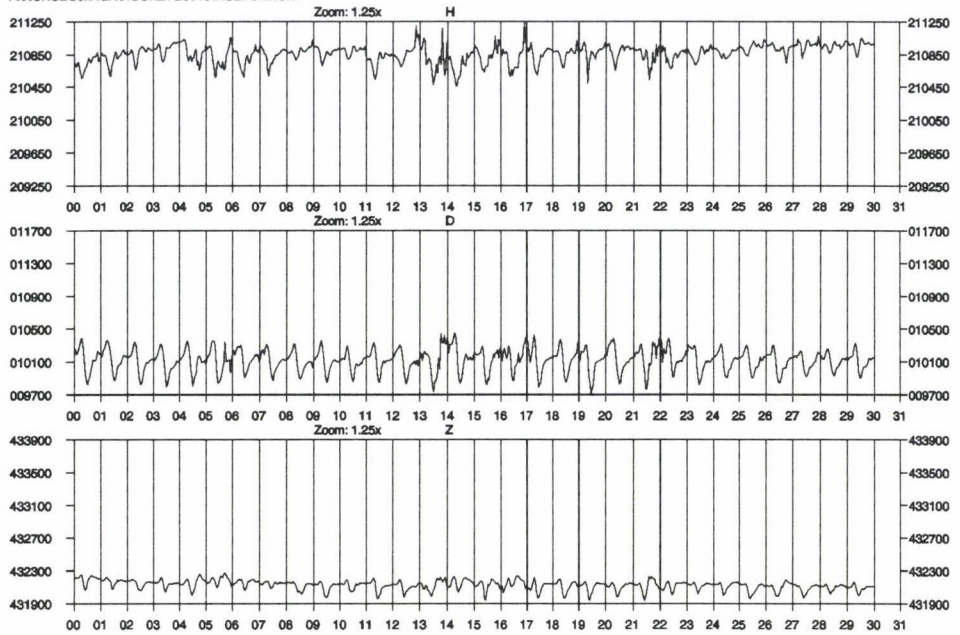
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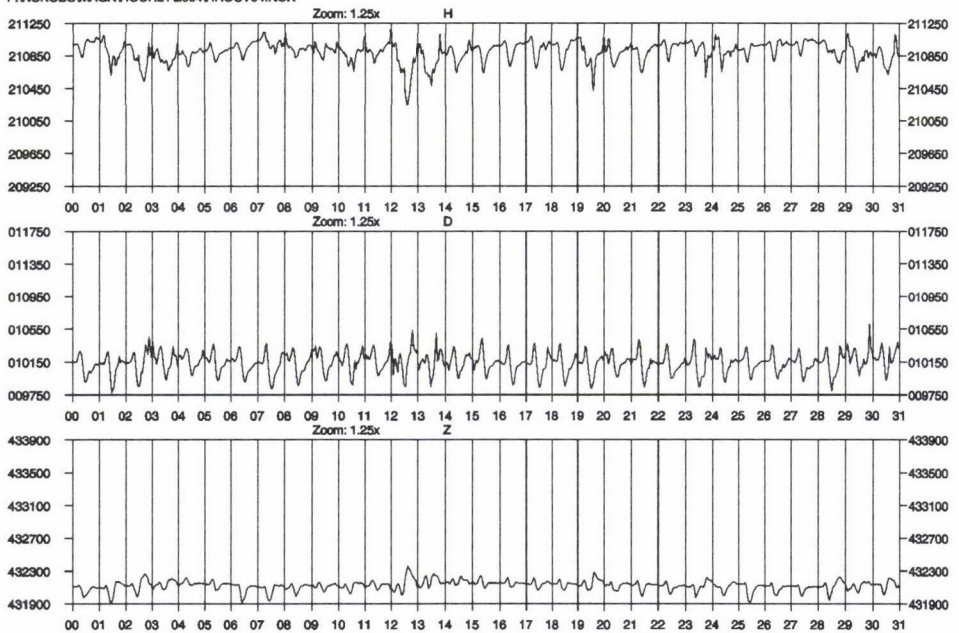
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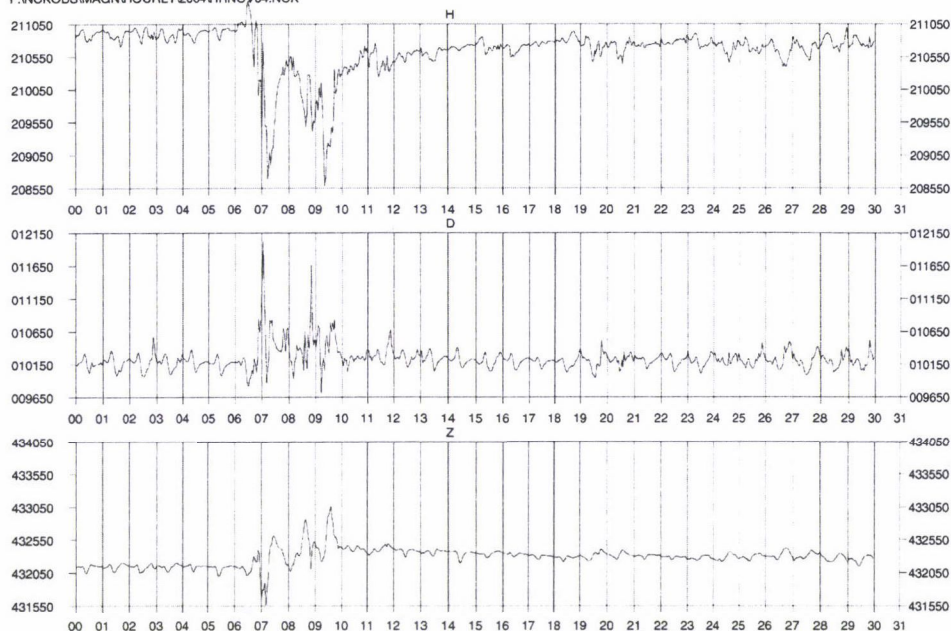
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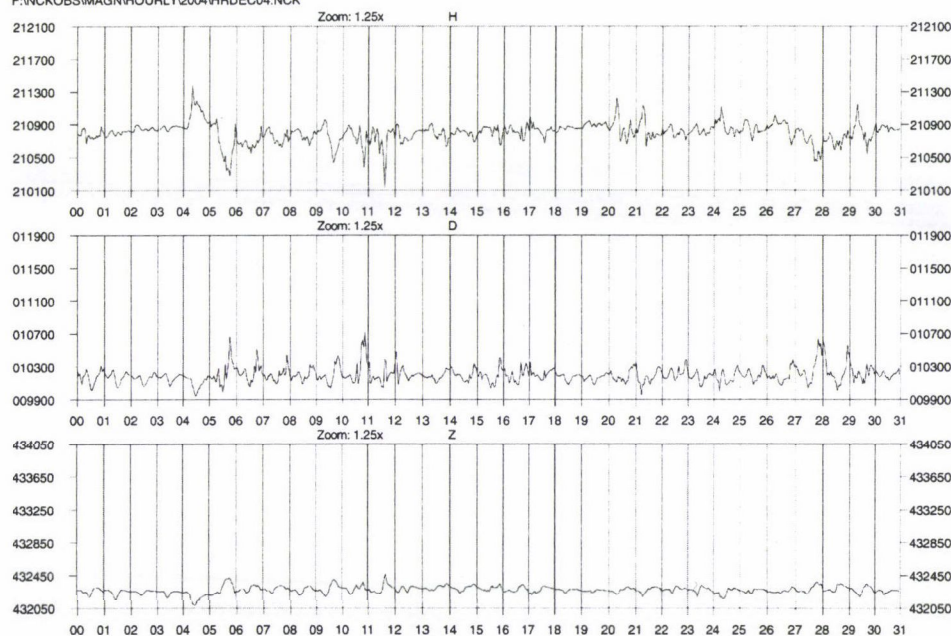
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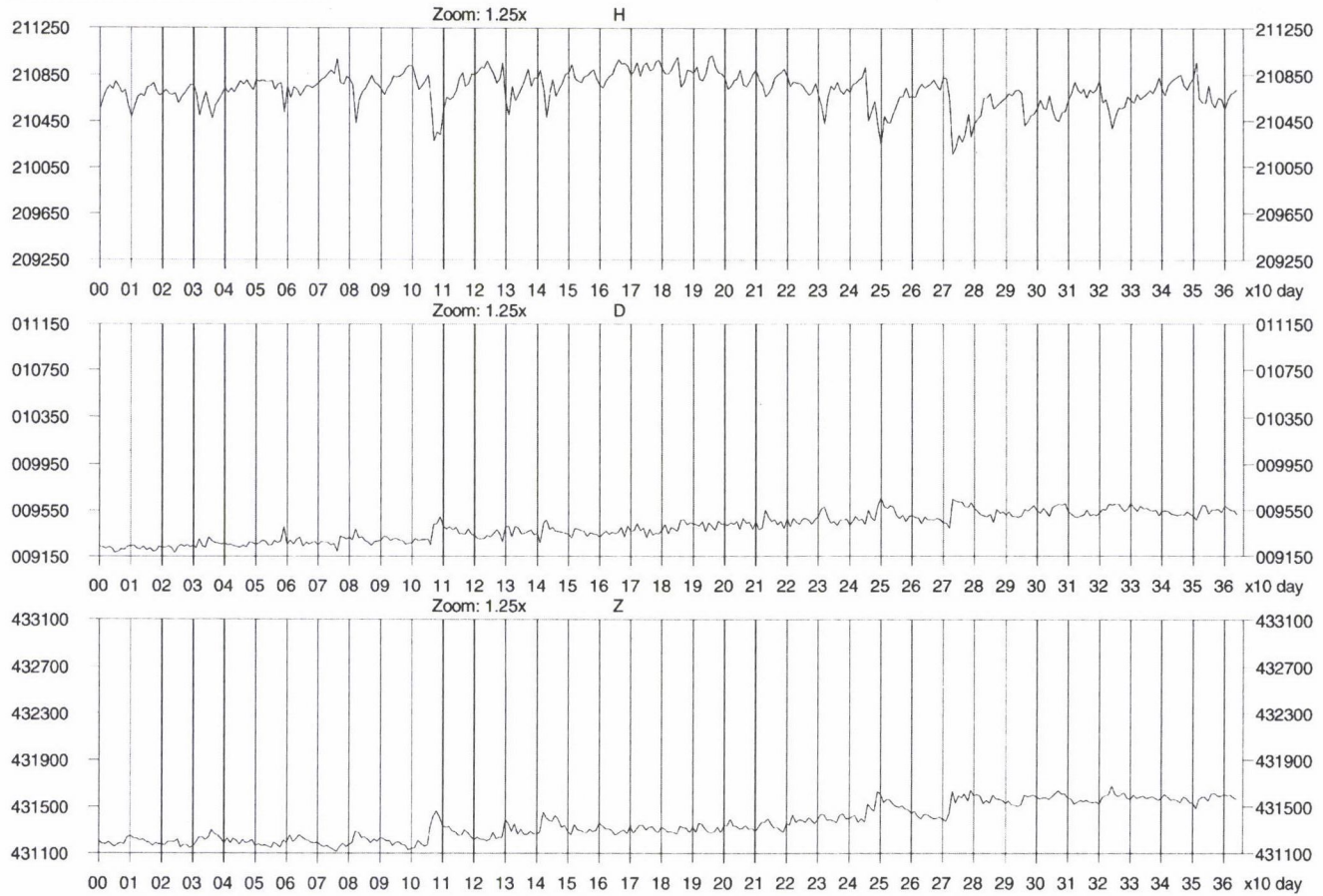


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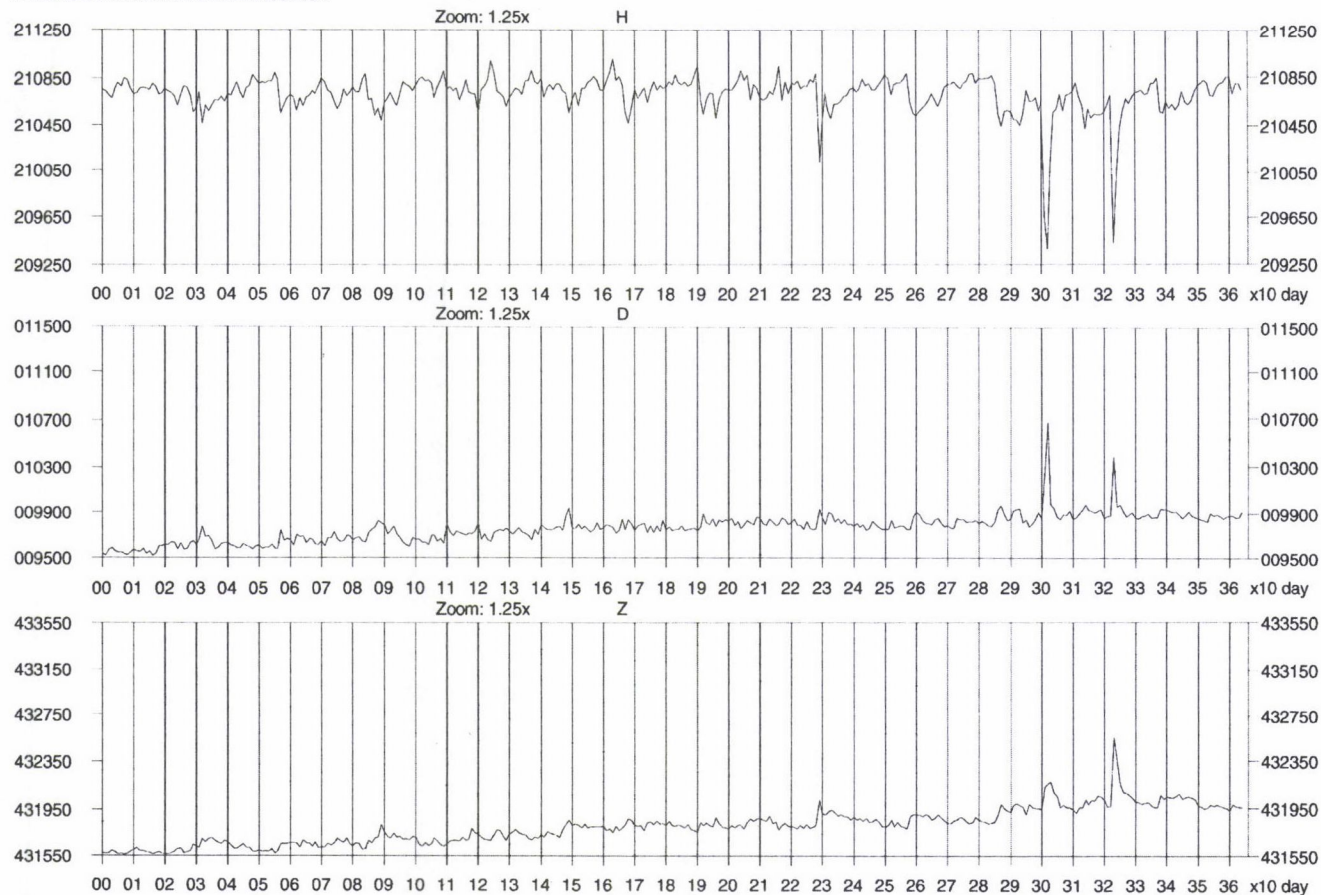
Daily mean values of H , D , Z
2002-2004

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Daily mean values 2002

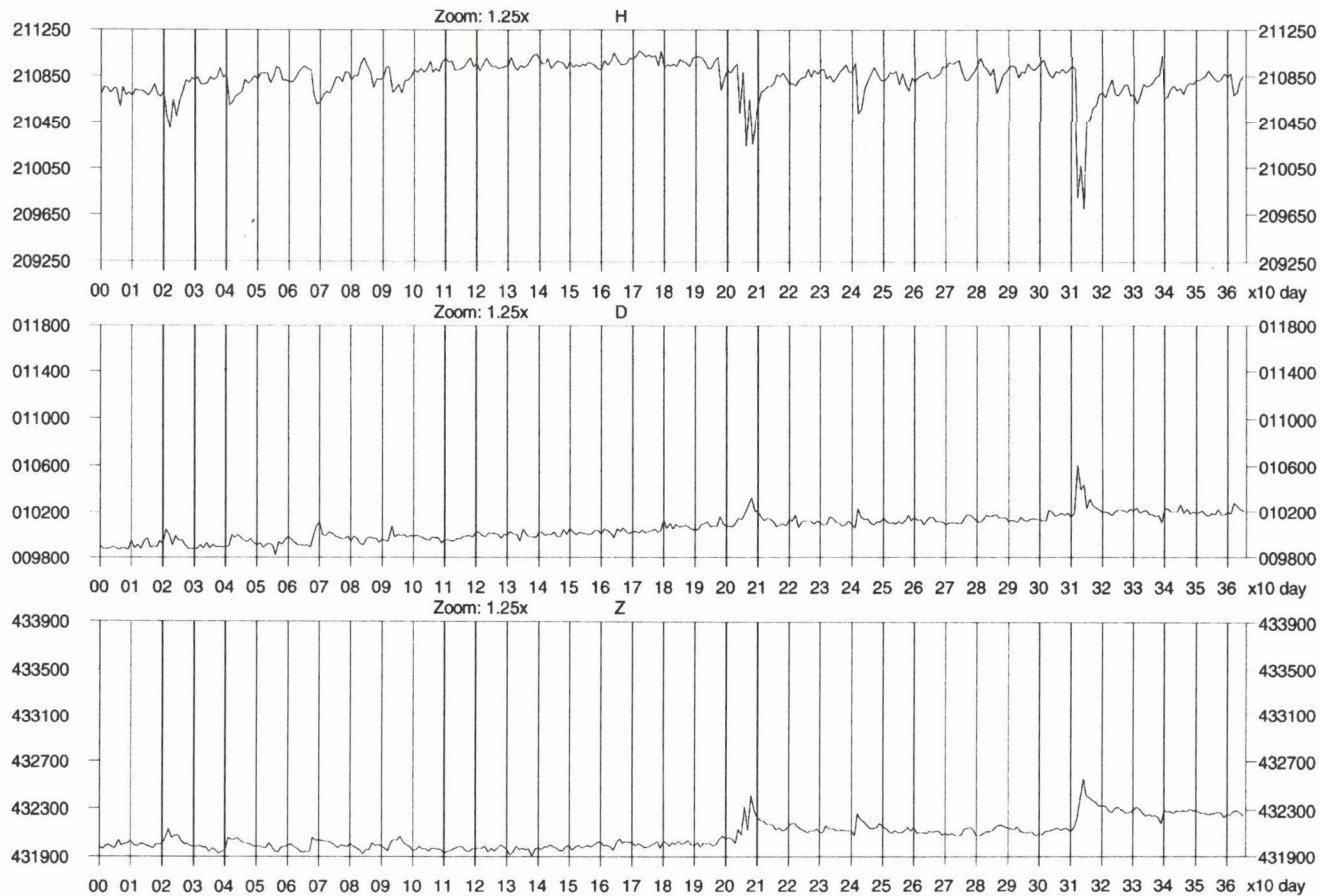
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Daily mean values 2003

DAILY MEAN VALUES 2003

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Daily mean values 2004

Geomagnetic K indices
2002–2004

Date	K	Sum	Date	K	Sum
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020102	10012211	8	020212	32221013	14
020103	00022220	8	020213	12233410	16
020104	00010012	4	020214	00111000	3
020105	10100000	2	020215	00010110	3
020106	00000100	1	020216	01021201	7
020107	01020232	10	020217	33332103	18
020108	33322100	14	020218	01222234	16
020109	00010201	4	020219	21210021	9
020110	01233653	23	020220	10023213	12
020111	33332543	26	020221	11222123	14
020112	43333442	26	020222	22222142	17
020113	22233224	20	020223	21111001	7
020114	22223232	18	020224	01121011	7
020115	01232212	13	020225	20222143	16
020116	11100100	4	020226	12122223	15
020117	32122413	18	020227	10121012	8
020118	30010100	5	020228	14333356	28
020119	01133444	20	020301	43111100	11
020120	43222232	20	020302	11122222	13
020121	43222332	21	020303	11233234	19
020122	01131112	10	020304	32222332	19
020123	30132243	18	020305	54433433	29
020124	13010000	5	020306	23443433	26
020125	11033441	17	020307	11232103	13
020126	32232121	16	020308	11221010	8
020127	22232211	15	020309	10122311	11
020128	21133212	15	020310	01123104	12
020129	21130001	8	020311	24233222	20
020130	00000011	2	020312	22332323	20
020131	21000004	7	020313	21323100	12
020201	43233313	22	020314	10110000	3
020202	44333403	24	020315	00211022	8
020203	11021200	7	020316	10021010	5
020204	02001123	9	020317	00010011	3
020205	42234465	30	020318	10115333	17
020206	43433342	26	020319	55422222	24
020207	23333113	19	020320	10003421	11
020208	21133421	17	020321	22311232	16
020209	22131044	17	020322	23321100	12
020210	33211101	12	020323	00143334	18

Date	K	Sum	Date	K	Sum
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020326	12343134	21	020506	01112323	13
020327	01201010	5	020507	21012322	13
020328	00000010	1	020508	22222212	15
020329	00010024	7	020509	30132111	12
020330	23435333	26	020510	21243445	25
020331	34333343	26	020511	00156664	28
020401	33333321	21	020512	42313223	20
020402	23332211	17	020513	32013211	13
020403	33322122	18	020514	25333354	28
020404	12111101	8	020515	34322342	23
020405	00001010	2	020516	21122132	14
020406	11011111	7	020517	00112012	7
020407	11223210	12	020518	01112065	16
020408	00111010	4	020519	44300000	11
020409	01001001	3	020520	12232342	19
020410	00212312	11	020521	30302114	14
020411	21233333	20	020522	22222322	17
020412	42234333	24	020523	24167733	33
020413	32233233	21	020524	00100000	1
020414	23024410	16	020525	00000121	4
020415	10101122	8	020526	10111322	11
020416	23201021	11	020527	42334323	24
020417	31255762	31	020528	22212222	15
020418	64543334	32	020529	21102101	8
020419	33455556	36	020530	11112212	11
020420	56434653	36	020531	10110110	5
020421	21001113	9	020601	00010212	6
020422	33221311	16	020602	44233324	25
020423	03533524	25	020603	23211132	15
020424	31121112	12	020604	33433322	23
020425	20000010	3	020605	31001101	7
020426	00000111	3	020606	10111101	6
020427	12123243	18	020607	00011120	5
020428	34333322	23	020608	00134433	18
020429	22232232	18	020609	32211132	15
020430	31122210	12	020610	22324432	22
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020502	20001311	8	020612	31112123	14
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Date	K	Sum	Date	K	Sum
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020617	21100211	8	020728	34222323	21
020618	01124332	16	020729	12114321	15
020619	33231322	19	020730	12111232	13
020620	21131010	9	020731	00012331	10
020621	12122232	15	020801	03345435	27
020622	11001223	10	020802	54234435	30
020623	12212222	14	020803	52232332	22
020624	22111311	12	020804	24232231	19
020625	22123113	15	020805	12010112	8
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020627	00000110	2	020807	10111110	6
020628	00000100	1	020808	00002234	11
020629	00010122	6	020809	22223343	21
020630	13223223	18	020810	44223223	22
020701	33244321	22	020811	02133333	18
020702	21100121	8	020812	32333313	21
020703	01111020	6	020813	33220032	15
020704	11001012	6	020814	12124433	20
020705	22212333	18	020815	21243355	25
020706	34343433	27	020816	32312210	14
020707	42112221	15	020817	03212122	13
020708	21022124	14	020818	32012155	19
020709	32332332	21	020819	53443345	31
020710	22221232	16	020820	24202356	24
020711	10001113	7	020821	44423343	27
020712	23254422	24	020822	33321220	16
020713	23121111	12	020823	11111132	11
020714	01020100	4	020824	22110010	7
020715	00210210	6	020825	10111002	6
020716	11132344	19	020826	12243534	24
020717	33223543	25	020827	33233314	22
020718	22210000	7	020828	02221223	14
020719	01033413	15	020829	30013311	12
020720	45322124	23	020830	11223120	12
020721	34314431	23	020831	01112123	11
020722	22343323	22	020901	42122125	19
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020905	13221201	12	021016	32233363	25
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020907	24312566	29	021018	33223243	22
020908	75321234	27	021019	33211133	17
020909	20002134	12	021020	33222123	18
020910	40123455	24	021021	22221122	14
020911	02332534	22	021022	31332140	17
020912	33222242	20	021023	11233424	20
020913	42132031	16	021024	44355655	37
020914	23211121	13	021025	44444233	28
020915	10011222	9	021026	23445553	31
020916	00123110	8	021027	33324444	27
020917	02122332	15	021028	43333353	27
020918	32234122	19	021029	32233142	20
020919	21234532	22	021030	22321233	18
020920	21100002	6	021031	43245542	29
020921	10123310	11	021101	10120232	11
020922	11212231	13	021102	53334455	32
020923	10110000	3	021103	33235665	33
020924	00110010	3	021104	33332545	28
020925	00011101	4	021105	34334334	27
020926	20110123	10	021106	42334455	30
020927	20022211	10	021107	33121232	17
020928	10111221	9	021108	00121030	7
020929	00211112	8	021109	00111233	11
020930	23444335	28	021110	44422222	22
021001	22436746	34	021111	12334132	19
021002	55432424	29	021112	13144152	21
021003	53333566	34	021113	33234111	18
021004	75343365	36	021114	21122321	14
021005	43234543	28	021115	22222123	16
021006	12320244	18	021116	31111013	11
021007	34534565	35	021117	32100110	8
021008	44344543	31	021118	31111233	15
021009	01433443	22	021119	33322135	22
021010	23232114	18	021120	22221574	25
021011	11121222	12	021121	34555455	36
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021127	54223223	23
021128	22213441	19
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021201	32233424	23
021202	22232433	21
021203	22233231	18
021204	11223442	19
021205	22121310	12
021206	11021323	13
021207	33333244	25
021208	23312333	20
021209	21011101	7
021210	20010011	5
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021212	11012100	6
021213	10011001	4
021214	22232433	21
021215	31112120	11
021216	11011002	6
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021218	00002000	2
021219	23443562	29
021220	32224465	28
021221	54222322	22
021222	20024243	17
021223	31344453	27
021224	30235553	26
021225	32213241	18
021226	20122435	19
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021229	21221533	19
021230	30212242	16
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Date	K	Sum	Date	K	Sum
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030102	10012121	8	030212	11131453	19
030103	30112645	22	030213	11021005	10
030104	54222243	24	030214	43133444	26
030105	11122224	15	030215	44244522	27
030106	01110123	9	030216	22233445	25
030107	11111142	12	030217	21222312	15
030108	20100001	4	030218	24422234	23
030109	00001021	4	030219	11023334	17
030110	12122334	18	030220	22333353	24
030111	33121124	17	030221	13221443	20
030112	11212222	13	030222	22224403	19
030113	32120013	12	030223	32123333	20
030114	32231212	16	030224	00111003	6
030115	30012201	9	030225	10112101	7
030116	10121021	8	030226	11322223	16
030117	01112201	8	030227	44234444	29
030118	11224343	20	030228	21132436	22
030119	22233444	24	030301	31233243	21
030120	44122342	22	030302	22122353	20
030121	43333333	25	030303	31123365	24
030122	22122445	22	030304	44344544	32
030123	54123323	23	030305	32133544	25
030124	32222444	23	030306	53332444	28
030125	34344323	26	030307	43222033	19
030126	53233343	26	030308	01123323	15
030127	33100413	15	030309	12221134	16
030128	44222123	20	030310	02222445	21
030129	11123554	22	030311	32222420	17
030130	52333541	26	030312	11111013	9
030131	32343211	19	030313	33123011	14
030201	21000264	15	030314	11234253	21
030202	55443565	37	030315	43223443	25
030203	42134554	28	030316	11134454	23
030204	44532254	29	030317	24335456	32
030205	52123412	20	030318	44445122	26
030206	22233343	22	030319	33222232	19
030207	33113241	18	030320	02334335	23
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Date	K	Sum	Date	K	Sum
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030327	42334433	26	030507	54534442	31
030328	23322445	25	030508	33244554	30
030329	43223365	28	030509	43435324	28
030330	52333445	29	030510	75311341	25
030331	32135555	29	030511	42434333	26
030401	43221342	21	030512	22332252	21
030402	12322445	23	030513	43343344	28
030403	22212244	19	030514	43324453	28
030404	43333355	29	030515	22223424	21
030405	33223453	25	030516	21001123	10
030406	11100312	9	030517	21111110	8
030407	10013101	7	030518	01000343	11
030408	42243311	20	030519	33212333	20
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030410	23343343	25	030521	32122545	24
030411	12121243	16	030522	54324342	27
030412	21013310	11	030523	13242412	19
030413	21212011	10	030524	33223344	24
030414	22033334	20	030525	32231313	18
030415	32233222	19	030526	42322133	20
030416	42353455	31	030527	33333344	26
030417	13243441	22	030528	44444343	30
030418	13243323	21	030529	32326677	36
030419	12011133	12	030530	56244655	37
030420	22113324	18	030531	55202111	17
030421	33322343	23	030601	14323244	23
030422	53343344	29	030602	34433423	26
030423	13332342	21	030603	43243334	26
030424	20214345	21	030604	23233442	23
030425	24242315	23	030605	21012232	13
030426	21323342	20	030606	22123333	19
030427	22121433	18	030607	43333324	25
030428	33221021	14	030608	33343555	31
030429	12103463	20	030609	23233334	23
030430	33223456	28	030610	22533332	23
030501	63334422	27	030611	23323231	19
030502	24222202	16	030612	10102311	9
030503	12132111	12	030613	10001233	10

Date	K	Sum	Date	K	Sum
030614	23234443	25	030725	00322110	9
030615	34322333	23	030726	22135654	28
030616	34233354	27	030727	53333321	23
030617	34345543	31	030728	11024333	17
030618	43542443	29	030729	34224454	28
030619	32232341	20	030730	23333444	26
030620	03222331	16	030731	33354444	30
030621	42212324	20	030801	53335134	27
030622	21211332	15	030802	33222442	22
030623	43342323	24	030803	32221333	19
030624	43334223	24	030804	02110233	12
030625	12332334	21	030805	30111203	11
030626	33234223	22	030806	53332222	22
030627	43335433	28	030807	02124565	25
030628	24255434	29	030808	44442453	30
030629	33343344	27	030809	23332225	22
030630	33322322	20	030810	32121231	15
030701	22112222	14	030811	01222333	16
030702	11222333	17	030812	33433432	25
030703	31113444	21	030813	23223124	19
030704	44353434	30	030814	32322232	19
030705	43324342	25	030815	22222323	18
030706	21112332	15	030816	22121220	12
030707	32313221	17	030817	00005455	19
030708	00002100	3	030818	54635645	38
030709	01100021	5	030819	43333322	23
030710	11223123	15	030820	01211435	17
030711	33435544	31	030821	34545655	37
030712	45433244	29	030822	54445555	37
030713	32212322	17	030823	35334433	28
030714	11223334	19	030824	31332242	20
030715	53242245	27	030825	23422322	20
030716	43444344	30	030826	30011223	12
030717	43133243	23	030827	00111233	11
030718	22112334	18	030828	42232232	20
030719	31244435	26	030829	11023342	16
030720	33123224	20	030830	33121211	14
030721	32100010	7	030831	11002120	7
030722	10121230	10	030901	22310241	15
030723	12212332	16	030902	31124123	17
030724	21002223	12	030903	22223233	19

Date	K	Sum	Date	K	Sum
030904	32223344	23	031015	24454656	36
030905	42221320	16	031016	43345544	32
030906	31021222	13	031017	44444334	30
030907	10000110	3	031018	33325444	28
030908	00002113	7	031019	43335565	34
030909	21134244	21	031020	32223445	25
030910	41232343	22	031021	42345666	36
030911	32122243	19	031022	44434641	30
030912	22121120	11	031023	20311100	8
030913	32100013	10	031024	01115766	27
030914	00001022	5	031025	42335414	26
030915	00000033	6	031026	22231155	21
030916	42335343	27	031027	22322210	14
030917	54445655	38	031028	44352534	30
030918	55353654	36	031029	11955576	39
030919	43344553	31	031030	84344698	46
030920	34324523	26	031031	87666444	45
030921	31123432	19	031101	53323354	28
030922	32233451	23	031102	32333353	25
030923	13232422	19	031103	33221333	20
030924	54435354	33	031104	33671232	27
030925	42334544	29	031105	10010024	8
030926	31122333	18	031106	30011264	17
030927	10010001	3	031107	22021221	12
030928	00011220	6	031108	10013432	14
030929	00010002	3	031109	11326563	27
030930	00100212	6	031110	33233455	28
031001	30000055	13	031111	54345654	36
031002	22211223	15	031112	43233652	28
031003	33322432	22	031113	42556666	40
031004	01122000	6	031114	54345354	33
031005	00000114	6	031115	24555654	36
031006	10122133	13	031116	24436665	36
031007	41232433	22	031117	44445654	36
031008	11121012	9	031118	52333532	26
031009	42121100	11	031119	10123440	15
031010	00000001	1	031120	02357978	41
031011	10010000	2	031121	66543332	32
031012	00011012	5	031122	52133564	29
031013	32113355	23	031123	34323254	26
031014	22334377	31	031124	32124234	21

Date	K	Sum
031125	33322422	21
031126	12112323	15
031127	22111121	11
031128	22022000	8
031129	11111102	8
031130	12010343	14
031201	23120103	12
031202	01220001	6
031203	00000200	2
031204	00000134	8
031205	34435545	33
031206	42332533	25
031207	20113354	19
031208	24234565	31
031209	23335545	30
031210	53234555	32
031211	54545555	38
031212	33223445	26
031213	33235554	30
031214	43224655	31
031215	43235433	27
031216	21220332	15
031217	21011210	8
031218	11000000	2
031219	00100000	1
031220	00033533	17
031221	44222443	25
031222	23233443	24
031223	12100231	10
031224	01001322	9
031225	00012200	5
031226	21010113	9
031227	22131115	16
031228	23223342	21
031229	10021300	7
031230	10000132	7
031231	32112654	24

Date	K	Sum	Date	K	Sum
040101	33225554	29	040211	20024653	22
040102	43123343	23	040212	33443553	30
040103	23333363	26	040213	43234445	29
040104	32324552	26	040214	31223534	23
040105	43234655	32	040215	34441432	25
040106	42221136	21	040216	40010020	7
040107	33344552	29	040217	00000111	3
040108	00021014	8	040218	31010333	14
040109	32423442	24	040219	32110133	14
040110	33433342	25	040220	02000010	3
040111	00135532	19	040221	20011131	9
040112	01001344	13	040222	30012242	14
040113	21024544	22	040223	21022223	14
040114	32123332	19	040224	32011233	15
040115	12024554	23	040225	20012032	10
040116	42233554	28	040226	00000000	0
040117	22233354	24	040227	03012053	14
040118	22232055	21	040228	12333443	23
040119	32214543	24	040229	23154445	28
040120	33224513	23	040301	32324553	27
040121	12223252	19	040302	32423244	24
040122	54365464	37	040303	21233331	18
040123	43344665	35	040304	00120220	7
040124	52221334	22	040305	11111001	6
040125	45344554	34	040306	21000000	3
040126	31133354	23	040307	00020022	6
040127	32314414	22	040308	00020000	2
040128	63222453	27	040309	01133555	23
040129	10112013	9	040310	55634255	35
040130	22232344	22	040311	43335765	36
040131	10131111	9	040312	54222534	27
040201	13211133	15	040313	30434233	22
040202	10333514	20	040314	32323254	24
040203	32324423	23	040315	33233342	23
040204	41232234	21	040316	31022223	15
040205	32231223	18	040317	22010132	11
040206	13442452	25	040318	22222234	19
040207	10210031	8	040319	41011022	11
040208	00010103	5	040320	21012533	17
040209	10112032	10	040321	32213231	17
040210	00021301	7	040322	31101343	16

Date	K	Sum	Date	K	Sum
040323	11010032	8	040503	00100023	6
040324	10000001	2	040504	22210022	11
040325	00000211	4	040505	11122433	17
040326	10114553	20	040506	12111033	12
040327	22234535	26	040507	23223243	21
040328	35332432	25	040508	22121222	14
040329	21223322	17	040509	12001100	5
040330	01233121	13	040510	00010012	4
040331	00312330	12	040511	32111124	15
040401	00001020	3	040512	44010110	11
040402	00000000	0	040513	01421243	17
040403	21134566	28	040514	00001112	5
040404	61022222	17	040515	32110002	9
040405	00003355	16	040516	10000001	2
040406	42453043	25	040517	10010002	4
040407	31112144	17	040518	10011000	3
040408	23233122	18	040519	01013322	12
040409	33321031	16	040520	11231221	13
040410	22101045	15	040521	32100310	10
040411	31111231	13	040522	12221001	9
040412	32210040	12	040523	32122221	15
040413	10001031	6	040524	22334201	17
040414	10000002	3	040525	11001000	3
040415	00121024	10	040526	00000110	2
040416	12231243	18	040527	20000000	2
040417	11021102	8	040528	00012212	8
040418	01101223	10	040529	23231324	20
040419	30111101	8	040530	21123234	18
040420	00000102	3	040531	43232231	20
040421	13110031	10	040601	32233223	20
040422	00102011	5	040602	22211223	15
040423	12234424	22	040603	12111112	10
040424	10032222	12	040604	12122221	13
040425	03311211	12	040605	33122324	20
040426	00000310	4	040606	33223141	19
040427	01001011	4	040607	22112115	15
040428	00212243	14	040608	31121231	14
040429	00000011	2	040609	32232433	22
040430	33101255	20	040610	32202132	15
040501	31112232	15	040611	31000010	5
040502	10031030	8	040612	02000000	2

Date	K	Sum	Date	K	Sum
040613	00121212	9	040724	32435546	32
040614	10012232	11	040725	66566776	49
040615	33324333	24	040726	63111246	24
040616	22112001	9	040727	75667765	49
040617	02121222	12	040728	33213433	22
040618	12122221	13	040729	11211100	7
040619	22011200	8	040730	00110123	8
040620	10000101	3	040731	12112211	11
040621	01000200	3	040801	42111033	15
040622	02000000	2	040802	00001103	5
040623	00000100	1	040803	11000000	2
040624	00202000	4	040804	00001000	1
040625	00002010	3	040805	00001212	6
040626	02123311	13	040806	20000013	6
040627	00001002	3	040807	31133223	18
040628	22132243	19	040808	10100000	2
040629	34332342	24	040809	20222344	19
040630	12212221	13	040810	42014433	21
040701	32222223	18	040811	20322332	17
040702	22122323	17	040812	31021111	10
040703	11101220	8	040813	11000113	7
040704	21020002	7	040814	22232121	15
040705	21012222	12	040815	11002000	4
040706	02111100	6	040816	00002212	7
040707	01000010	2	040817	20012233	13
040708	00000000	0	040818	11312112	12
040709	11000010	3	040819	10001101	4
040710	01100221	7	040820	21133323	18
040711	31034235	21	040821	33321144	21
040712	43211134	19	040822	21122332	16
040713	43322333	23	040823	20001200	5
040714	01111321	10	040824	10010100	3
040715	11010123	9	040825	01010100	3
040716	00004214	11	040826	10002222	9
040717	54421022	20	040827	10101132	9
040718	10120201	7	040828	11210121	9
040719	12012313	13	040829	00022122	9
040720	13113232	16	040830	31233636	27
040721	21100000	4	040831	43432242	24
040722	00034346	20	040901	11111323	13
040723	54554421	30	040902	20000001	3

Date	K	Sum	Date	K	Sum
040903	10000000	1	041014	33234444	27
040904	00010001	2	041015	23112331	16
040905	10011330	9	041016	30000000	3
040906	31132423	19	041017	00000000	0
040907	31122121	13	041018	00000231	6
040908	32212000	10	041019	00000112	4
040909	00001013	5	041020	11223304	16
040910	00000000	0	041021	23221020	12
040911	00000000	0	041022	31211311	13
040912	00000100	1	041023	00000102	3
040913	00000054	9	041024	11011442	14
040914	33324465	30	041025	23332311	18
040915	53213322	21	041026	00000000	0
040916	31323444	24	041027	00002211	6
040917	52223325	24	041028	10000002	3
040918	43123000	13	041029	00002242	10
040919	00100014	6	041030	42122334	21
040920	30433302	18	041031	31133442	21
040921	22011112	10	041101	30012002	8
040922	00324443	20	041102	10110022	7
040923	43210102	13	041103	10020345	15
040924	21020212	10	041104	12210233	14
040925	01021110	6	041105	20010000	3
040926	10000022	5	041106	00000000	0
040927	00012200	5	041107	23042577	30
040928	01200013	7	041108	88743355	43
040929	10000013	5	041109	45356796	45
040930	10000020	3	041110	77767743	48
041001	00010022	5	041111	44332425	27
041002	12112223	14	041112	43443454	31
041003	00123224	14	041113	11111202	9
041004	33021243	18	041114	43111010	11
041005	10000012	4	041115	00000000	0
041006	10010000	2	041116	00122223	12
041007	00000000	0	041117	00110001	3
041008	00122102	8	041118	00000100	1
041009	41100001	7	041119	00000123	6
041010	31122023	14	041120	22123453	22
041011	22213313	17	041121	22233532	22
041012	11110003	7	041122	10110011	5
041013	44425444	31	041123	20010123	9

Date	K	Sum
041124	21112013	11
041125	23224243	22
041126	21120224	14
041127	00101424	12
041128	31211223	15
041129	32232445	25
041130	33222253	22
041201	22320213	15
041202	11000110	4
041203	00000010	1
041204	00000000	0
041205	01421211	12
041206	21315444	24
041207	22322343	21
041208	21113223	15
041209	30022132	13
041210	21112423	16
041211	00205445	20
041212	22342643	26
041213	43210100	11
041214	01222122	12
041215	21000312	9
041216	12203255	20
041217	33232423	22
041218	43223021	17
041219	10010000	2
041220	20110011	6
041221	10342332	18
041222	34343233	25
041223	11111332	13
041224	00000210	3
041225	42421113	18
041226	22111331	14
041227	21211032	12
041228	21012354	18
041229	42223304	20
041230	23433433	25
041231	21122113	13

Special phenomena
SSC-s 2002–2004

Date	CET	Ampl.	Hx	Hy	Hz	Remark
	(UT+1h)	in H(nT)				
020217	0253	23	+	-	+	
020228	0549	18	+	-	+	
020318	1420	74	+	-	+	
020320	1427	20	+	-	+	
020329	2337	41	+	-	+	
020417	1206	51	+	-	-	
020419	0935	39	+	-	-	
020423	0546	23	+	-	+	
020510	1224	26	+	-	+	
020511	1113	34	+	-	-	
020518	2106	77	+	-	-	
020520	0438	10	+	-	+	
020523	1149	27	+	-	-	
020523	1641	100	+	-	+	
020601	1744	11	+	-	+	
020608	1241	17	+	-	+	
020719	1107	20	+	-	-	
020729	1421	49	+	-	-	
020801	0608	4	+	-	-	
020801	0010	52	+	-	+	
020818	1943	65	+	-	-	
020904	0247	9	+	-	-	
020907	1736	23	+	-	+	
020930	0910	15	+	-	-	
021109	1652	11	+	-	+	
021109	1948	22	+	-	+	
021126	2249	29	+	-	-	
030127	0209	14	+	-	+	
030408	0207	32	+	-	+	

Date	CET (UT+1h)	Ampl. in H(nT)	Hx	Hy	Hz	Remark
030529	1324	42	+	-	+	
030530	1724	58	+	-	+	
030608	1153	30	+	-	-	
030629	0408	10	+	-	+	
030817	1522	58	+	-	+	
031024	1617	46	+	-	+	
031026	2007	14	+	-	+	
031028	0306	16	+	-	+	
031029	0710	870	-	+	+	
031104	0727	46	+	-	-	
031115	0649	29	+	-	+	
031120	0901	49	-	+	-	
031121	0350	28	+	-	+	
040122	0236	48	+	-	+	
040403	1509	33	+	-	+	
040409	0331	16	+	-	+	
040410	2109	34	+	+	-	
040716	1453	23	+	-	+	
040722	1132	21	+	-	-	
040724	0710	40	+	-	-	
040726	2349	79	+	-	-	
040730	2214	27	+	-	+	
040913	2103	53	+	-	+	
041107	1257	12	+	-	+	
041107	1151	35	+	-	-	
041107	1922	54	+	-	-	
041111	1808	28	+	-	+	
041205	0846	36	+	-	-	

Special phenomena
sfe 2002–2004

Date	Beginning	Maximum	End	Ampl.	Sign		
	GMT	GMT	GMT	nT	Hx	Hy	Hz
020122	1525	1530	1537	3	–	+	–
020518	0800	0808	0811	2	–	+	–
020610	0710	0722	0730	19	–	+	+
020627	1633	1640	1647	4	–	+	–
020711	1013	1019	1025	2	–	+	–
020730	1234	1238	1252	2	–	+	–
021012	1027	1033	1039	6	+	–	+
030610	1024	1030	1033	14	–	+	–
030903	0823	0829	0834	9	–	+	–
031108	1735	1738	1741	15	–	+	+
031129	0737	0744	0751	3	–	+	–
031201	1217	1223	1228	8	–	+	–
040401	1343	1352	1407	5	–	+	+
040502	1218	1229	1238	18	–	+	–
041109	1030	1034	1040	29	–	+	–

Annual mean values of geomagnetic elements

Year	D	H nT	Z nT	I	X nT	Y nT	F nT
1961	-0°23.6'	20816	42077	63°40.7'	20816	-143	46944
1962	-0°19.6'	20827	42093	63°40.5'	20827	-119	46964
1963	-0°14.3'	20839	42116	63°40.4'	20839	-87	46990
1964	-0°10.5'	20845	42126	63°40.4'	20845	-64	47001
1965	-0°08.1'	20877	42137	63°38.6'	20877	-49	47025
1966	-0°06.8'	20888	42156	63°38.5'	20888	-41	47047
1967	-0°06.0'	20903	42179	63°38.3'	20903	-36	47074
1968	-0°03.0'	20921	42196	63°37.7'	20921	-18	47098
1969	0°00.2'	20942	42214	63°36.9'	20942	1	47123
1970	0°02.8'	20964	42235	63°36.1'	20964	17	47152
1971	0°04.3'	20992	42262	63°35.2'	20992	26	47188
1972	0°06.5'	21011	42286	63°34.7'	21011	40	47218
1973	0°10.2'	21028	42317	63°34.6'	21028	62	47254
1974	0°13.6'	21046	42350	63°34.5'	21046	83	47291
1975	0°18.5'	21072	42380	63°33.8'	21072	113	47330
1976	0°23.8'	21084	42413	63°34.0'	21084	146	47365
1977	0°28.8'	21106	42443*	63°33.6''*	21105	177	47401*
1978	0°34.6'	21108	42473*	63°34.4''*	21107	212	47429*
1979	0°41.4'	21113*	42496*	63°34.8''*	21112*	254	47452*
1980	0°46.3'	21107*	42512*	63°35.8''*	21105*	284	47463*
1981	0°52.4'	21097*	42530*	63°37.0''*	21095*	322	47475*
1982	0°57.5'	21078	42549	63°38.8'	21075	353	47484
1983	1°02.7'	21078	42581	63°39.8'	21074	384	47512
1984	1°08.1'	21075	42601	63°40.7'	21071	417	47529
1985	1°12.7'	21073	42625	63°41.7'	21068	446	47550
1986	1°17.8'	21065	42660	63°43.1'	21060	477	47577
1987	1°21.9'	21067	42689	63°44.0'	21061	502	47604
1988	1°26.6'	21052	42723	63°46.0'	21045	530	47628
1989	1°31.3'	21041	42761	63°48.0'	21034	559	47657
1990	1°35.5'	21044	42782	63°48.3'	21036	584	47678
1991	1°36.3'	21027	42816	63°50.4'	21019	589	47701
1992	1°38.1'	21037	42834	63°50.4'	21028	600	47721
1993	1°43.2'	21039	42853	63°51.0'	21030	631	47739
1994	1°48.4'	21037	42877	63°52.0'	21026	663	47760
1995	1°56.6'	21052	42898	63°51.7'	21039	713	47785
1996	2°02.0'	21062	42920	63°51.7'	21048	747	47809
1997	2°07.5'	21060	42955	63°52.9'	21045	781	47839
1998	2°13.7'	21053	42997	63°54.7'	21037	819	47875
1999	2°18.3'	21055	43030	63°55.6'	21038	847	47905

Year	D	H nT	Z nT	I	X nT	Y nT	F nT
2000	2°23.7'	21054	43068	63°56.9'	21035	880	47938
2001	2°28.4'	21064	43099	63°57.2'	21045	909	47972
2002	2°33.7'	21072	43136	63°57.9'	21051	942	48008
2003	2°39.6'	21071	43180	63°59.3'	21048	978	48047
2004	2°44.4'	21084	43208	63°59.4'	21060	1008	48078

III. ATMOSPHERIC ELECTRICITY AND THE IONOSPHERE

ATMOSPHERIC ELECTRICITY DATA

Hourly means of the potential gradient

Atmospheric electricity data have been published since 1962. This table contains the hourly average values of the potential gradient expressed in V/m. The date column gives year, month, day (e.g. 990101 indicates 1999 January 1). Hourly averages have been taken only from hours having a recording period of 30 minutes or more. If values were available only for part of an hour the average is entered in square brackets []. These data have been used in the determination of the daily means. Values uncertain for some reason are entered in round brackets () and have not been used in calculating daily means. Daily means of each day with 24 hours of recording are entered. However, loss of a maximum of one hour's data out of twelve (for example, on account of instrument maintenance or calibration) has not precluded entering this mean value. In hours marked by S the value of the potential gradient exceeded permanently or several times the measuring limits of the equipment making the determination of an hourly average impossible. The direction of the deviations is marked by signs. OBS indicates that the potential gradient exceeded the measuring limits of the equipment both in positive and negative directions. Gaps of some days are generally due to missing records. Data are presented in universal time (GMT).

See CD (program Seenck.exe, menu item AtmElectr).

*Hourly means of the
2002*

Date	00	01	02	03	04	05	06	07	08	09	10	11
020101	10	30	40	30	40	40	40	[40]	40	-20	30	40
020102	30	40	30	20	30	30	40	30	[0]	+S	+S	50
020103	40	40	40	30	30	40	[40]	-	50	50	50	50
020104	50	40	40	40	40	50	50	70	[70]	60	50	60
020105	60	50	50	50	60	50	70	[80]	[80]	80	70	70
020106	60	60	50	60	60	60	70	70	80	[90]	90	70
020107	30	40	40	20	40	40	40	-	[30]	30	50	50
020108	40	40	30	20	30	40	50	[50]	[80]	70	50	80
020109	40	30	40	30	40	40	50	[60]	50	50	60	80
020110	60	80	60	70	60	50	40	[30]	[40]	30	30	40
020111	-30	0	-10	-10	-20	20	0	[-10]	10	10	30	30
020112	60	50	30	30	40	30	30	40	[30]	30	40	30
020113	30	50	40	-10	20	40	40	[40]	30	-10	0	10
020114	10	20	10	10	10	30	20	-	-	30	20	20
020115	-20	0	0	-10	10	20	20	[30]	20	30	20	0
020116	-10	-10	20	30	-10	10	10	0	10	0	0	-20
020117	-20	-20	-10	0	0	0	10	0	10	10	20	30
020118	30	40	40	40	30	50	30	{40}	30	40	50	60
020119	40	30	40	30	30	10	-10	20	60	50	70	60
020120	70	80	40	40	50	50	70	60	60	60	70	60
020121	30	30	20	0	-50	-40	10	-	-	10	10	20
020122	90	100	90	100	110	80	60	40	-	-	-	-10
020123	0	20	20	20	30	30	70	80	[100]	130	120	70
020124	40	20	30	40	40	50	70	[60]	70	80	70	50
020125	50	40	30	30	40	40	40	[40]	-S	-S	OBS	30
020126	0	-10	-10	0	-10	0	10	[0]	+S	OBS	-S	30
020127	80	70	30	40	40	60	50	[50]	80	70	80	60
020128	10	10	-20	30	80	80	-	60	-	[30]	30	20
020129	10	20	20	20	20	20	30	[30]	30	40	40	50
020130	30	30	30	20	30	30	30	[30]	40	40	40	50
020131	40	40	40	30	30	40	20	[40]	60	60	50	50

potential gradient

12	13	14	15	16	17	18	19	20	21	22	23	mean
40	40	50	50	50	60	60	60	50	40	40	30	39
30	50	50	50	40	OBS	OBS	10	50	50	40	40	–
50	50	50	60	60	60	80	100	80	70	80	70	55
70	70	80	90	80	60	70	70	70	70	70	50	61
70	70	70	60	60	60	50	50	80	80	80	70	65
70	80	70	70	70	70	80	80	60	50	40	30	66
60	70	80	90	80	100	80	70	80	80	80	60	58
70	80	80	70	60	60	70	70	60	40	40	40	55
70	90	90	80	60	80	90	100	80	80	80	70	64
70	70	60	30	30	40	20	0	–10	–10	–40	–30	34
50	10	30	40	40	40	30	10	30	30	30	60	18
30	30	50	40	40	80	70	20	30	20	20	80	40
10	20	40	30	20	30	50	40	50	30	30	10	27
30	30	40	40	40	50	40	40	20	10	0	0	–
–10	20	40	20	30	40	0	–20	0	–30	–10	–30	7
20	30	30	40	30	20	30	30	40	10	10	–10	13
30	30	30	40	50	40	30	30	20	40	40	30	18
50	40	40	40	40	30	30	30	20	40	50	40	39
80	80	90	80	80	100	80	110	130	90	80	80	63
60	50	50	50	50	70	50	60	40	80	40	40	54
0	–40	–60	–10	20	40	80	110	130	140	130	120	–
30	50	40	30	40	40	30	30	–10	–30	–20	–20	–
40	40	40	40	40	30	30	20	30	10	20	20	44
50	30	50	80	70	80	80	70	50	50	40	40	55
20	30	40	50	60	70	70	50	40	30	20	10	–
60	80	80	30	30	50	30	30	10	20	0	30	–
60	80	70	–S	–S	40	40	30	10	20	30	40	–
20	30	50	50	50	50	30	30	30	20	10	10	–
40	50	50	50	40	40	40	70	50	50	40	30	37
40	40	40	50	50	70	70	50	50	50	40	40	41
50	40	40	40	30	40	50	40	40	30	40	40	41

Date	00	01	02	03	04	05	06	07	08	09	10	11
020201	40	30	30	20	20	20	30	[30]	40	50	40	40
020202	40	40	40	40	40	30	30	[40]	50	50	50	50
020203	-20	10	-20	-10	0	-10	-60	-60	-20	[-10]	-60	-20
020204	-60	-80	-60	-80	-40	-10	-	-	-	40	60	40
020205	70	70	120	90	80	110	110	100	[90]	130	90	80
020206	20	10	10	20	40	40	70	[70]	70	(50)	40	50
020207	80	50	40	0	-10	0	10	20	[10]	-30	-70	-50
020208	30	20	10	20	10	20	20	[30]	-10	-40	40	50
020209	40	40	40	30	0	20	10	[-10]	10	40	40	50
020210	40	40	0	OBS	30	-10	0	(30)	40	40	30	30
020211	30	30	20	20	20	30	-	-	-	40	40	40
020212	30	30	30	30	30	30	20	[30]	40	50	60	50
020213	30	30	20	20	20	20	30	[30]	40	30	20	40
020214	10	20	10	10	0	10	20	[30]	30	40	40	40
020215	30	30	20	30	30	40	40	[40]	40	30	40	40
020216	40	50	50	50	40	40	40	[40]	60	40	40	40
020217	20	20	10	0	0	20	10	10	10	[20]	10	20
020218	40	50	100	110	-	+S	-	-	-	50	60	60
020219	30	30	30	30	30	40	40	[20]	[30]	40	40	40
020220	10	10	10	10	10	10	20	-	-	30	20	30
020221	-20	20	20	20	20	0	10	[30]	30	30	30	30
020222	30	30	30	30	10	20	30	[40]	40	30	40	30
020223	30	40	30	30	30	30	[30]	20	40	40	40	40
020224	OBS	-S	10	10	20	10	20	[30]	30	30	30	30
020225	30	30	30	20	30	30	-	-	-	-20	-10	20
020226	40	70	70	50	50	60	60	[40]	60	60	40	50
020227	20	20	10	20	30	30	30	[40]	40	60	50	40
020228	10	10	10	30	20	20	20	[20]	10	10	10	30

12	13	14	15	16	17	18	19	20	21	22	23	mean
40	40	40	40	40	40	40	40	40	40	40	40	36
60	60	50	50	50	50	40	40	-10	30	0	-40	37
0	-10	-10	-20	-30	-60	-10	0	-10	-20	-40	-70	-23
40	40	40	40	40	40	50	40	50	50	50	80	-
130	130	80	70	60	40	30	100	30	60	50	10	80
50	50	60	50	50	60	80	80	70	40	30	40	48
-30	30	70	70	40	40	30	20	20	20	20	30	17
60	60	60	40	40	40	50	50	40	30	30	40	31
40	40	40	40	20	20	30	30	20	-10	-10	40	25
40	40	40	40	40	40	40	40	30	30	40	30	-
40	40	40	20	40	50	50	50	40	40	40	30	-
40	40	40	50	50	40	30	30	30	30	30	30	36
40	30	30	40	30	30	20	10	OBS	10	-S	+S	-
50	50	50	60	50	40	40	40	40	50	40	40	34
40	40	50	40	50	50	60	70	70	60	50	40	43
40	40	40	40	40	40	30	40	30	30	20	10	39
20	40	30	30	20	0	OBS	OBS	-10	10	30	30	-
50	40	30	20	30	40	60	90	30	20	10	20	-
30	40	40	40	50	20	-10	-70	-40	20	20	10	23
40	40	40	40	30	30	30	40	30	30	10	-20	-
30	30	OBS	+S	20	30	20	20	30	30	30	30	-
30	30	40	30	30	40	20	20	20	-50	-50	10	22
30	0	-S	20	30	40	20	30	OBS	OBS	OBS	20	-
30	40	30	10	30	40	60	40	40	30	30	30	-
30	30	20	-60	-60	-50	-140	-50	-50	-30	-20	-10	-
60	50	50	40	40	40	40	40	50	40	30	30	49
40	50	40	40	30	40	40	40	20	10	0	0	31
OBS	30	70	30	20	-20	20	20	20	30	30	10	20

Date	00	01	02	03	04	05	06	07	08	09	10	11
020301	10	10	20	10	10	10	20	20	[20]	20	0	0
020302	10	10	10	20	30	30	10	[10]	20	0	0	-10
020303	10	30	10	10	20	10	20	[40]	30	30	30	50
020304	40	40	30	30	40	40	-	-	-	(40)	50	50
020305	20	10	10	20	20	30	+S	30	[30]	20	20	20
020306	70	50	40	40	30	40	40	[70]	40	30	40	30
020307	30	30	30	30	20	30	30	[40]	40	40	-	30
020308	-10	0	0	0	10	20	30	40	[40]	40	40	50
020309	30	30	30	30	30	20	30	30	[40]	40	40	40
020310	40	30	20	10	20	30	30	[10]	0	30	40	40
020311	30	30	30	20	30	30	-	[40]	-	50	40	50
020312	30	30	20	30	30	20	30	40	[30]	30	30	40
020313	20	10	10	20	10	10	10	[20]	30	30	40	40
020314	40	30	40	30	30	50	40	[60]	60	50	40	40
020315	20	20	-10	10	-10	-10	-10	[-10]	0	20	20	30
020316	0	20	20	20	0	-10	-10	[10]	20	30	40	50
020317	30	10	10	0	10	0	[-20]	-30	-10	0	20	20
020318	10	10	10	0	0	0	-	20	-	30	30	40
020319	20	20	30	30	40	40	40	[50]	50	50	50	50
020320	40	40	30	40	40	30	30	-	-	-	OBS	OBS
020321	120	50	40	30	-10	0	[-S]	OBS	50	OBS	OBS	OBS
020322	50	30	30	30	30	10	40	[40]	40	20	30	OBS
020323	40	40	30	OBS	50	50	40	[30]	30	30	50	OBS
020324	10	10	10	10	10	10	10	10	10	30	[40]	30
020325	10	10	10	20	20	20	-	-	[10]	20	20	20
020326	-10	-10	10	0	-10	10	30	[40]	30	40	40	40
020327	40	40	40	40	40	40	40	[60]	60	70	50	50
020328	30	10	10	10	10	20	30	[40]	50	60	70	70
020329	30	20	30	30	30	30	40	[50]	60	80	80	80
020330	40	30	40	50	40	40	30	[40]	[40]	40	40	40
020331	50	40	40	50	50	[60]	50	50	30	40	40	50

12	13	14	15	16	17	18	19	20	21	22	23	mean
0	30	30	40	40	40	40	40	30	30	20	20	21
10	-10	-10	-20	0	-10	30	40	20	10	10	20	10
-S	80	50	50	60	70	60	70	50	50	40	40	40
40	50	50	40	40	50	60	40	20	20	20	10	-
30	30	50	50	40	30	40	40	50	30	20	50	30
20	-S	20	30	40	40	40	50	50	40	40	40	40
30	50	50	30	20	20	10	30	30	-S	OBS	OBS	-
50	60	60	70	60	60	60	70	50	50	40	40	39
40	30	30	30	20	20	20	20	30	20	40	40	30
30	30	30	40	30	20	40	70	70	50	40	40	33
50	50	50	40	40	40	40	40	40	40	30	30	-
30	40	40	40	40	40	40	40	40	40	40	30	34
40	40	40	40	30	50	40	40	40	30	20	30	28
40	50	50	40	40	30	40	40	50	50	30	30	42
30	30	40	40	30	30	30	20	20	10	10	0	15
50	60	60	60	40	40	40	40	40	40	20	20	29
20	30	30	30	30	20	20	30	20	10	10	10	13
40	40	50	40	30	40	40	40	30	30	20	30	-
50	30	30	0	0	-20	50	50	50	50	60	50	36
OBS	OBS	OBS	OBS	OBS	OBS	OBS	OBS	120	170	120	170	-
OBS	70	70	0	OBS	100	OBS	70	70	70	70	60	-
OBS	-S	OBS	OBS	OBS	10	-S	40	50	50	40	40	-
OBS	OBS	OBS	OBS	OBS	OBS	OBS	30	30	30	20	0	-
-10	40	30	OBS	30	40	40	40	40	40	30	10	23
10	10	0	10	0	0	0	-10	-10	-10	-10	-10	-
40	50	50	40	30	30	40	40	40	30	40	40	28
40	50	40	40	40	70	60	50	50	40	30	30	46
70	70	60	60	80	50	40	40	40	40	40	40	43
90	90	100	80	80	80	80	80	60	50	40	50	60
50	60	70	50	40	40	40	50	40	40	20	20	41
40	40	40	40	30	20	40	30	30	20	20	30	39

Date	00	01	02	03	04	05	06	07	08	09	10	11
020401	30	30	20	30	30	20	[20]	–	50	50	60	60
020402	30	30	30	20	20	10	[10]	–	20	30	40	40
020403	10	20	30	20	10	10	[20]	20	20	40	40	40
020404	30	30	30	30	20	20	[30]	40	40	40	40	40
020405	10	20	10	10	30	30	[40]	40	40	40	40	40
020406	40	30	30	20	20	30	[40]	40	40	40	40	40
020407	30	30	40	OBS	20	30	50	(40)	40	50	40	40
020408	20	20	20	20	20	–	30	[40]	40	40	40	40
020409	20	20	40	30	30	40	[40]	40	40	40	40	40
020410	40	40	40	30	30	30	[30]	–20	0	10	0	0
020411	50	20	10	0	20	–10	–20	10	30	20	40	30
020412	10	10	20	20	10	10	10	20	–50	–40	–30	–20
020413	–20	20	40	0	–30	–20	[–20]	30	0	–10	10	0
020414	30	30	40	50	30	40	50	OBS	OBS	OBS	–10	OBS
020415	20	10	0	10	0	–	10	20	10	20	10	40
020416	30	40	40	40	40	40	50	[40]	40	40	40	40
020417	30	40	30	30	30	30	[40]	30	20	40	OBS	OBS
020418	0	20	10	10	20	30	[30]	40	40	40	40	40
020419	10	0	10	0	0	0	[–10]	0	10	10	20	30
020420	30	30	20	10	20	[20]	0	10	30	20	20	40
020421	30	30	20	20	10	20	30	[30]	40	40	40	40
020422	30	30	40	40	40	–	30	–	30	40	40	40
020423	–10	0	0	–20	–10	0	[0]	40	40	40	50	50
020424	–S	30	OBS	30	70	70	20	40	50	30	–10	–S
020425	30	30	30	20	30	40	[40]	40	40	40	40	40
020426	20	20	20	20	30	30	[30]	30	40	30	40	30
020427	40	40	30	10	0	–10	[0]	20	40	0	20	30
020428	30	20	20	10	20	20	[30]	30	20	30	30	30
020429	20	10	10	10	10	–	+S	OBS	40	–	30	30
020430	10	20	10	20	30	40	[40]	30	40	40	40	30

12	13	14	15	16	17	18	19	20	21	22	23	mean
60	70	70	60	50	40	40	60	40	30	30	30	43
40	40	40	40	30	30	40	30	30	10	10	10	27
40	40	40	50	40	30	30	40	40	30	40	40	31
40	40	40	40	30	10	10	30	20	10	10	10	28
40	40	30	40	40	50	60	60	60	60	50	40	38
40	40	40	40	50	40	40	30	40	40	30	30	36
40	40	50	60	50	40	40	50	40	40	30	20	—
50	50	50	40	40	20	40	50	40	30	10	10	33
50	40	50	60	40	40	40	30	30	30	30	40	38
20	30	10	30	40	−10	−100	−80	40	30	30	30	13
20	0	10	−10	10	20	10	0	20	20	30	30	15
OBS	OBS	OBS	30	40	40	70	80	80	50	40	30	—
30	30	30	20	30	40	50	50	40	40	40	30	18
OBS	−80	20	40	50	40	30	40	40	40	40	30	—
40	50	30	50	50	40	40	40	40	40	40	30	28
40	40	50	40	40	40	40	40	40	40	40	40	40
−10	+S	OBS	OBS	−10	30	40	40	50	20	20	30	—
40	40	40	40	40	40	40	40	30	30	20	10	30
30	40	40	50	50	40	50	60	60	40	40	30	25
70	40	40	40	40	40	40	30	30	30	30	30	30
40	40	40	40	40	30	30	30	20	10	20	30	30
40	40	40	40	40	40	40	40	30	30	10	10	—
50	50	−S	OBS	OBS	30	40	40	30	30	30	20	—
OBS	0	20	10	30	20	40	40	40	40	30	30	—
40	40	40	40	40	40	40	40	30	30	20	20	35
0	OBS	30	40	40	30	10	20	20	20	10	30	26
40	30	40	40	40	40	40	40	40	40	30	30	28
30	20	30	30	30	20	20	30	30	30	10	10	24
30	40	30	20	10	10	10	OBS	OBS	OBS	20	20	—
30	30	30	30	30	30	40	30	30	30	20	20	29

Date	00	01	02	03	04	05	06	07	08	09	10	11
020501	30	10	10	20	30	40	[30]	10	10	20	40	30
020502	10	10	0	-10	-20	0	30	[30]	30	20	10	10
020503	10	20	10	10	20	20	[20]	20	30	40	30	30
020504	20	10	10	10	10	10	[30]	30	30	20	30	30
020505	20	10	OBS	0	+S	-10	-10	[0]	40	30	30	40
020506	OBS	OBS	0	-10	-10	-	-	-	20	40	30	40
020507	10	20	20	10	40	60	[90]	40	20	30	40	30
020508	10	10	10	10	20	30	[30]	30	40	40	30	30
020509	30	20	20	20	10	30	[20]	20	20	20	30	20
020510	20	20	10	10	20	10	[20]	20	30	40	40	40
020511	20	20	20	20	20	[20]	30	20	20	30	30	20
020512	20	20	10	20	20	20	30	[30]	30	40	40	40
020513	20	20	20	10	10	-	10	10	10	20	-	30
020514	10	10	10	10	10	20	[20]	20	30	30	40	-S
020515	30	20	20	20	30	30	[30]	30	30	30	30	30
020516	20	10	10	10	20	30	[30]	40	40	50	40	40
020517	10	0	10	10	20	20	[20]	30	40	40	40	40
020518	10	10	10	20	10	20	[10]	20	30	40	50	60
020519	10	10	10	10	10	30	[40]	30	10	10	10	20
020520	0	0	-10	10	-10	30	-	[-30]	20	80	80	20
020521	0	0	0	10	10	20	-	-	20	20	10	30
020522	10	10	20	30	20	-10	[-10]	[-10]	-10	-10	10	20
020523	10	-10	-10	-10	[0]	10	10	20	30	40	40	40
020524	30	20	20	20	10	20	[20]	[30]	20	30	30	30
020525	30	30	20	10	20	20	[20]	40	40	30	40	40
020526	OBS	OBS	OBS	-30	30	30	20	20	10	40	30	30
020527	30	30	30	20	30	-	[30]	-	40	50	40	30
020528	40	30	20	30	30	70	[70]	[50]	20	30	40	-S
020529	20	20	20	30	30	40	[40]	40	40	40	40	40
020530	50	40	40	40	40	40	[40]	40	40	40	30	30
020531	30	30	30	30	30	30	[40]	[40]	40	40	50	50

12	13	14	15	16	17	18	19	20	21	22	23	mean
30	30	30	30	40	30	30	30	20	30	10	10	25
20	20	30	20	30	20	20	20	20	20	20	20	16
30	30	40	40	40	40	30	30	30	30	30	30	28
10	0	20	20	20	20	10	20	OBS	40	30	0	19
50	40	40	50	50	40	40	30	20	0	-60	OBS	-
40	50	60	50	40	40	40	30	30	30	20	20	-
20	20	20	20	20	20	10	10	10	10	0	0	24
20	30	40	40	40	40	40	40	30	40	30	30	30
20	20	30	20	20	20	20	20	20	20	10	20	21
10	30	40	40	40	40	40	40	40	30	50	30	30
30	20	20	20	+S	+S	0	10	10	10	10	10	-
50	40	40	40	40	-S	30	10	20	0	20	20	27
30	20	30	30	20	30	20	10	10	10	10	10	-
OBS	-S	80	30	40	40	30	30	30	20	20	30	-
30	30	30	30	30	40	30	30	30	20	20	10	28
40	40	40	40	40	30	30	30	30	20	20	10	30
50	40	30	0	10	10	10	10	20	20	20	10	21
60	60	50	50	40	40	30	30	30	30	30	20	32
20	20	30	30	20	10	10	10	10	10	10	0	16
-10	-10	-10	0	0	-10	-10	-10	-10	0	0	0	5
30	40	30	30	30	30	30	10	10	10	10	20	-
30	30	30	30	30	20	20	10	10	10	0	10	13
40	40	30	30	30	40	+S	40	40	30	30	20	23
30	40	40	40	30	30	30	20	20	20	30	20	26
40	40	50	50	40	50	40	50	120	+S	-S	+S	-
30	40	50	50	50	40	40	40	40	40	40	30	-
40	50	50	50	40	40	40	30	OBS	OBS	40	50	-
20	30	30	30	20	20	20	20	20	20	20	20	30
40	50	40	40	40	40	50	50	50	50	40	40	39
40	40	40	50	50	50	40	40	40	30	30	40	40
50	40	40	50	50	40	40	40	30	20	30	30	38

Date	0	1	2	3	4	5	6	7	8	9	10	11
020601	20	20	20	20	10	20	20	30	30	[30]	40	40
020602	40	40	40	40	40	40	[40]	40	40	40	40	40
020603	30	20	30	30	–	40	[50]	–	50	50	40	40
020604	10	10	20	20	30	30	[40]	[40]	40	50	50	50
020605	30	30	30	30	40	30	[30]	20	30	30	20	10
020606	10	20	30	10	20	+S	[30]	[20]	30	40	40	30
020607	OBS	+S	OBS	10	20	30	[30]	40	10	–10	–10	OBS
020608	30	20	0	0	–10	0	[10]	20	30	30	40	70
020609	30	30	20	20	20	40	90	[70]	50	+S	20	70
020610	30	30	20	10	10	–	20	–10	0	10	20	–10
020611	40	30	30	30	40	40	[50]	–	40	40	40	40
020612	40	30	20	20	20	30	[40]	30	30	50	40	40
020613	20	20	30	20	30	40	[40]	40	40	40	50	50
020614	20	20	10	20	30	40	40	[30]	30	30	+S	20
020615	40	40	30	20	30	[30]	30	40	30	40	40	60
020616	30	20	20	10	20	+S	OBS	40	[30]	40	50	60
020617	20	20	20	10	20	–	–	–	40	60	70	70
020618	30	30	30	30	30	30	[40]	40	40	50	60	60
020619	20	20	20	10	30	40	40	[30]	30	40	40	50
020620	20	20	20	10	10	20	[20]	20	30	40	40	40
020621	0	10	10	10	10	30	–	–	–	–	–	–
020622	40	30	30	30	30	30	[40]	[30]	40	50	50	60
020623	10	10	10	20	30	30	[30]	20	20	40	40	50
020624	20	10	10	10	10	–	[30]	–	30	40	40	50
020625	30	30	30	40	40	40	40	[50]	40	40	30	40
020626	30	20	20	20	20	30	[30]	[40]	50	40	40	50
020627	10	10	10	10	20	20	10	10	[10]	[20]	30	30
020628	40	30	30	20	20	30	[20]	30	30	OBS	OBS	OBS
020629	10	30	20	20	30	50	[70]	70	60	40	30	30
020630	20	20	20	20	20	20	[30]	30	30	30	40	40

12	13	14	15	16	17	18	19	20	21	22	23	mean
50	50	50	50	40	40	40	40	40	40	40	40	34
40	40	50	50	50	50	50	40	40	30	30	30	41
40	40	30	40	30	40	30	30	20	20	20	10	-
50	60	60	60	50	40	40	40	30	30	30	30	38
10	10	20	20	20	30	20	10	10	10	30	10	22
30	30	30	30	30	30	+S	20	70	OBS	+S	20	-
OBS	-10	0	10	30	30	40	40	40	30	30	20	-
80	50	50	40	40	30	40	20	30	OBS	OBS	30	-
60	50	40	30	30	10	10	20	40	40	40	40	38
0	OBS	OBS	120	90	30	30	40	40	40	30	40	-
40	40	40	50	50	60	60	40	40	50	40	50	43
40	40	50	60	50	40	40	30	30	30	20	20	35
OBS	OBS	50	30	30	-S	40	30	20	10	10	20	-
80	50	50	40	30	20	30	30	20	30	30	40	32
60	60	+S	+S	110	50	30	10	10	10	10	20	-
60	50	40	40	40	40	30	20	30	30	30	30	-
70	80	80	80	70	60	50	40	40	50	30	30	-
70	80	80	80	50	60	40	40	40	30	20	20	45
50	60	60	70	50	50	40	30	30	30	20	20	37
40	50	50	40	30	30	30	20	30	20	10	0	27
-	-	-	80	60	50	40	30	30	30	40	30	-
60	60	60	50	40	50	30	30	20	20	10	10	38
+S	OBS	+S	OBS	-S	OBS	10	20	10	10	30	20	-
60	50	50	40	40	40	30	20	30	30	30	30	-
40	40	40	50	40	50	40	40	30	30	30	30	38
50	50	50	50	40	40	30	30	20	10	10	10	33
30	40	30	40	30	30	30	30	30	10	30	40	23
OBS	30	120	80	70	40	20	30	10	20	50	20	-
30	30	-30	-10	30	30	40	40	40	30	30	30	31
40	40	40	50	40	40	30	30	30	30	30	30	31

Date	00	01	02	03	04	05	06	07	08	09	10	11
020701	20	20	20	20	20	–	–	–	30	40	40	40
020702	40	30	30	30	30	30	[30]	20	10	20	30	20
020703	20	10	10	10	20	30	[20]	30	20	20	30	30
020704	40	40	30	110	OBS	OBS	OBS	OBS	OBS	OBS	OBS	OBS
020705	20	10	10	10	10	20	[40]	40	40	40	40	40
020706	30	30	20	20	30	30	[40]	30	20	30	40	30
020707	OBS	OBS	–S	OBS	10	30	[70]	50	60	40	30	40
020708	40	30	10	10	20	–	–	–	50	50	50	50
020709	10	20	20	30	30	40	[30]	30	30	40	50	50
020710	30	30	30	30	30	30	[30]	30	30	40	40	40
020711	20	20	20	10	20	20	[20]	30	30	40	40	40
020712	30	30	30	30	30	30	[40]	70	40	40	50	60
020713	40	40	40	30	30	30	[30]	30	30	40	40	50
020714	30	30	30	40	50	40	40	[70]	40	40	40	40
020715	10	30	–30	OBS	70	–	70	–	[80]	80	60	60
020716	80	30	+S	OBS	30	80	OBS	70	80	50	50	30
020717	40	40	20	30	40	30	[40]	50	50	50	40	60
020718	30	40	30	30	20	30	[30]	30	30	20	30	40
020719	10	20	10	20	30	30	[30]	30	40	50	50	40
020720	40	30	30	30	20	30	40	[30]	30	40	30	40
020721	20	30	20	10	20	30	30	[30]	40	40	40	50
020722	40	30	10	10	30	–	–	70	70	30	20	20
020723	10	20	10	10	10	20	[20]	20	20	30	30	40
020724	30	30	30	20	10	30	[20]	–	20	30	20	–10
020725	30	20	30	30	30	40	[40]	30	30	40	40	40
020726	20	30	20	20	20	20	[30]	40	50	50	50	50
020727	30	30	30	30	30	30	[40]	40	40	60	50	40
020728	30	30	30	30	30	30	40	50	[50]	50	50	50
020729	10	10	10	10	20	–	–	30	40	50	50	50
020730	10	10	20	20	20	50	[70]	70	50	60	50	50
020731	30	40	30	30	40	30	[20]	20	30	40	40	40

12	13	14	15	16	17	18	19	20	21	22	23	mean
40	40	40	40	50	40	40	40	40	50	40	40	-
30	30	40	20	20	30	30	40	40	30	30	20	28
30	40	40	40	40	40	40	40	40	40	40	40	30
80	80	90	50	40	40	30	30	40	40	30	30	-
40	40	40	40	40	40	40	40	30	30	40	30	32
40	40	40	40	30	30	30	30	20	-S	OBS	OBS	-
40	40	40	40	40	40	40	30	40	40	40	40	-
50	50	50	50	40	30	20	30	20	20	10	20	-
50	50	50	50	50	50	50	40	40	40	40	30	38
40	40	40	40	30	30	40	40	40	30	20	30	34
30	30	30	40	30	30	30	30	30	40	30	30	29
60	70	70	70	70	70	50	40	40	40	30	30	47
-S	OBS	OBS	OBS	OBS	OBS	OBS	30	40	40	40	40	-
40	40	40	30	30	30	30	30	30	20	20	20	35
60	60	70	OBS	-S	40	30	30	20	20	20	20	-
OBS	OBS	OBS	10	40	120	-S	OBS	40	40	40	40	-
40	40	40	40	20	30	30	30	30	40	30	40	38
30	30	30	40	40	40	40	40	40	40	30	30	33
40	40	40	40	40	40	50	40	40	40	40	40	35
40	40	40	40	40	40	30	30	30	30	20	20	33
50	50	50	40	70	OBS	OBS	OBS	OBS	OBS	30	70	-
30	10	30	20	20	10	10	10	20	30	30	10	-
40	40	40	40	40	40	30	30	30	30	30	30	28
30	30	+S	30	30	10	0	0	20	20	30	30	21
30	30	20	30	30	20	20	30	40	40	30	30	31
50	50	40	40	40	40	40	40	50	40	40	40	38
50	50	50	40	50	40	30	30	30	30	30	30	38
50	40	50	50	40	40	30	30	30	20	30	20	38
50	50	60	70	30	30	20	30	30	OBS	0	30	-
50	50	50	60	50	50	40	30	OBS	-S	20	30	-
OBS	OBS	OBS	-S	30	10	10	10	10	10	0	0	-

Date	00	01	02	03	04	05	06	07	08	09	10	11
020801	10	10	10	50	40	60	[70]	70	90	70	60	50
020802	30	30	30	20	20	30	30	[30]	40	40	40	40
020803	40	40	40	40	30	[40]	[40]	40	40	50	50	40
020804	30	30	30	30	30	30	40	[40]	90	OBS	OBS	OBS
020805	30	30	30	20	30	-	-	[80]	80	70	40	40
020806	30	20	20	20	20	30	[30]	40	40	50	60	60
020807	-20	-S	-80	20	0	-70	[-30]	[90]	+S	150	130	70
020808	20	10	10	-70	10	60	[120]	[80]	90	80	80	60
020809	30	20	20	20	20	30	[30]	30	40	40	50	50
020810	40	40	40	40	40	40	[40]	40	40	40	40	40
020811	40	30	30	30	30	40	[30]	[30]	70	30	30	40
020812	OBS	-20	OBS	-10	10	10	-	-	40	40	OBS	OBS
020813	20	20	10	10	10	30	[40]	40	90	-20	40	50
020814	30	30	20	20	30	30	[20]	30	40	30	30	30
020815	20	10	10	10	20	20	[20]	20	20	30	30	30
020816	30	-S	40	40	30	40	OBS	OBS	90	80	40	40
020817	30	20	20	20	10	20	[20]	20	30	40	50	50
020818	+S	20	10	10	10	20	60	[50]	70	50	40	50
020819	-	-	-	-	-	-	-	30	30	20	40	60
020820	10	10	10	10	10	10	[20]	[20]	20	30	40	40
020821	10	10	10	20	20	30	OBS	-S	OBS	10	30	40
020822	10	OBS	OBS	-20	10	-10	[-50]	30	100	110	240	170
020823	30	30	20	30	20	70	40	40	[40]	30	30	40
020824	30	20	20	20	30	40	[50]	40	40	50	60	50
020825	40	40	20	40	30	40	[40]	30	30	40	40	40
020826	30	30	30	30	40	-	20	-	30	20	30	30
020827	20	10	10	10	10	10	[20]	30	20	30	40	40
020828	20	20	20	30	30	40	[50]	40	40	40	40	40
020829	40	40	50	40	50	70	[50]	[40]	OBS	40	40	40
020830	40	40	30	40	40	40	50	60	60	60	60	50
020831	40	40	40	40	30	20	[30]	40	60	70	30	50

12	13	14	15	16	17	18	19	20	21	22	23	mean
50	+S	OBS	OBS	70	50	40	50	50	50	40	40	–
50	50	50	50	50	50	50	40	50	50	50	50	40
40	50	40	50	40	40	40	40	40	40	40	40	41
130	50	90	130	40	40	40	40	40	30	30	40	–
50	50	50	50	40	40	40	40	40	30	30	30	–
60	40	+S	OBS	30	30	40	40	OBS	OBS	0	–20	–
60	80	50	40	40	60	40	50	40	40	30	30	–
40	50	50	50	40	40	40	40	30	40	30	30	43
60	50	50	50	40	40	OBS	OBS	10	40	40	40	–
40	40	40	40	40	40	50	50	40	40	30	30	40
–S	70	OBS	OBS	OBS	–S	OBS	40	40	30	70	+S	–
OBS	40	30	10	20	20	20	10	20	20	10	30	–
50	50	–S	OBS	30	40	40	40	30	40	40	30	–
30	30	30	40	40	40	40	30	40	30	10	10	30
40	40	30	30	40	30	40	30	40	30	40	30	28
40	40	50	50	+S	40	40	30	30	40	40	40	–
50	60	50	50	50	40	40	30	30	20	20	OBS	33
60	60	50	(40)	–	–	–	–	–	–	–	–	–
60	50	50	40	40	30	10	20	10	10	10	10	–
40	40	40	40	40	30	30	20	20	20	30	20	25
40	40	30	30	30	10	10	10	OBS	OBS	OBS	OBS	–
130	70	60	40	40	40	40	30	30	30	30	20	–
40	40	40	40	40	40	40	30	30	30	30	20	35
50	60	60	60	50	40	40	40	40	40	40	30	42
40	40	40	40	40	30	30	30	20	20	20	20	33
30	30	40	30	30	30	20	20	10	10	20	10	–
OBS	OBS	OBS	OBS	OBS	20	30	40	20	20	30	20	–
40	40	40	40	30	30	30	30	30	30	50	50	35
40	50	40	40	40	40	40	50	50	50	40	40	44
50	60	30	30	40	50	50	50	40	40	50	40	46
50	60	60	70	50	50	40	40	OBS	OBS	–S	–S	–

Date	00	01	02	03	04	05	06	07	08	09	10	11
020901	130	70	40	40	40	50	130	130	100	70	60	40
020902	40	40	40	40	40	–	50	–	50	60	60	60
020903	20	10	10	10	20	20	[30]	[30]	30	40	50	50
020904	20	10	20	10	20	30	[30]	[30]	30	30	30	30
020905	30	20	10	20	20	10	20	[20]	30	30	80	OBS
020906	10	10	20	20	10	30	80	[80]	80	60	40	40
020907	40	30	30	30	30	30	[40]	40	40	40	50	50
020908	10	20	20	20	20	20	20	[30]	40	30	40	50
020909	40	40	30	30	30	–	–	30	30	30	30	40
020910	40	40	40	40	30	30	[40]	40	30	40	30	40
020911	40	30	50	70	40	50	[50]	50	40	40	30	30
020912	40	40	40	40	40	40	40	[40]	50	60	50	60
020913	40	30	30	30	30	30	(30)	30	30	30	40	40
020914	20	20	20	20	20	[20]	30	30	40	40	50	50
020915	20	20	20	20	0	30	30	[20]	40	40	30	–S
020916	50	40	30	40	40	–	–	–	50	40	40	40
020917	10	10	10	10	20	10	[20]	[40]	40	40	30	30
020918	10	20	10	10	10	10	[30]	[30]	40	40	40	40
020919	20	10	20	20	10	20	30	[40]	40	40	40	50
020920	40	30	30	30	20	10	–	30	–50	30	40	40
020921	50	50	50	40	30	40	[50]	[50]	50	60	50	50
020922	20	30	–20	–150	–100	–10	[–40]	30	40	40	40	30
020923	20	30	30	30	50	–	–	–	70	90	90	40
020924	20	10	40	70	120	130	110	90	110	70	50	70
020925	60	60	70	40	50	50	[70]	70	90	50	30	–S
020926	30	30	30	20	30	40	[40]	40	50	50	40	40
020927	20	20	10	10	20	20	[40]	30	10	10	20	10
020928	40	30	20	10	10	10	[30]	30	30	10	10	–20
020929	30	30	30	30	30	30	[40]	30	50	60	50	50
020930	30	40	20	20	20	20	30	–	50	50	50	60

	12	13	14	15	16	17	18	19	20	21	22	23	mean
	40	40	50	50	50	50	50	50	50	40	40	40	60
	40	40	40	40	40	30	20	10	20	20	40	20	-
	40	40	40	30	40	40	30	30	30	20	30	30	30
	30	30	10	30	30	30	20	20	10	10	20	20	23
OBS	OBS	+S	30	40	30	30	40	40	40	20	40	50	-
	50	40	40	40	40	40	40	50	40	40	30	30	40
	40	60	50	40	40	30	40	30	20	20	20	10	35
	50	50	50	40	40	40	40	40	40	30	30	30	33
	40	40	40	40	40	40	30	30	30	30	30	40	-
	40	20	70	OBS	OBS	OBS	OBS	OBS	OBS	OBS	20	50	-
	30	20	30	20	20	10	30	40	40	40	40	40	37
	50	50	40	60	70	80	60	50	40	40	40	40	48
	40	40	40	40	40	40	40	50	40	40	40	30	37
	50	50	50	50	40	40	40	40	40	40	40	30	36
OBS	-S	+S	OBS	OBS	50	60	70	60	60	50	40	40	-
OBS	40	40	40	40	40	40	50	40	40	30	20	20	-
	30	30	20	10	40	30	30	30	20	20	10	10	23
	40	40	40	30	20	20	40	40	30	20	10	10	26
	50	50	50	50	40	30	40	40	40	40	20	30	34
	40	0	40	OBS	OBS	-S	40	50	40	30	60	40	-
	50	50	40	30	30	50	40	30	40	30	30	30	43
	0	30	30	40	30	30	40	40	40	30	30	20	11
	0	+S	-10	-S	-30	-60	-50	-S	-10	30	30	20	-
	70	100	80	70	50	60	60	20	40	40	40	60	66
-50	20	30	30	30	30	20	30	40	40	40	40	30	41
	20	30	40	40	30	40	40	40	30	10	20	20	33
	10	20	20	30	20	30	40	40	40	40	50	40	25
	0	-40	-20	-10	-20	10	40	40	50	40	40	40	16
	40	40	40	40	40	30	40	40	40	50	40	30	39
	60	60	60	70	40	40	40	40	40	40	30	40	41

Date	00	01	02	03	04	05	06	07	08	09	10	11
021001	40	30	20	20	20	30	[30]	40	50	70	50	50
021002	10	10	10	10	20	30	[40]	40	30	40	50	50
021003	10	10	10	20	10	20	[40]	50	50	40	40	40
021004	10	10	-S	OBS	OBS	-40	-	-	-	-	-	-
021005	30	20	10	20	20	30	[40]	70	70	40	40	30
021006	10	10	20	0	10	0	-20	-20	-50	20	20	20
021007	-50	10	10	0	10	-	[40]	-	40	40	40	40
021008	10	20	20	20	10	30	OBS	OBS	40	[20]	30	30
021009	40	40	40	30	40	30	[30]	30	20	30	30	20
021010	10	10	10	10	0	0	[0]	0	0	20	0	-20
021011	10	10	20	10	0	30	20	30	40	40	30	30
021012	-60	-80	0	30	-60	-80	[-60]	-40	20	-S	-S	OBS
021013	40	40	30	40	30	30	[40]	70	70	40	40	40
021014	30	30	30	30	30	-	[60]	-	40	40	40	40
021015	20	20	40	40	40	70	[80]	80	70	50	40	30
021016	20	40	30	30	40	40	[80]	100	80	50	60	50
021017	80	50	40	30	30	30	40	-	30	40	40	40
021018	OBS	OBS	OBS	-S	-70	-60	100	OBS	30	80	70	60
021019	50	40	40	40	40	0	30	[50]	50	50	50	40
021020	20	20	20	20	20	20	0	20	40	40	[50]	40
021021	50	50	40	40	40	60	50	-	0	-10	-10	20
021022	30	40	20	40	40	40	-	-	30	30	40	30
021023	110	100	130	120	90	110	120	[80]	70	30	40	40
021024	20	10	0	10	30	40	[50]	40	40	40	40	40
021025	10	10	-10	0	40	10	[10]	10	10	10	20	30
021026	10	30	40	20	20	20	[30]	40	40	30	30	20
021027	20	30	30	30	20	20	30	[40]	20	20	20	10
021028	-	-	-	-	-	-	-	-	-	[40]	40	40
021029	40	30	30	30	40	40	40	[60]	50	40	50	60
021030	30	40	40	50	60	40	40	[40]	40	40	70	30
021031	-50	-40	-20	10	10	50	40	[40]	30	20	0	-30

	12	13	14	15	16	17	18	19	20	21	22	23	mean
	50	40	40	40	30	30	40	50	40	30	20	20	37
	50	40	40	30	20	40	40	40	40	20	20	10	30
	40	40	40	40	30	30	30	30	30	30	10	20	30
	-	-	-	20	20	-10	-50	-30	30	30	40	40	-
	40	40	40	40	40	50	50	40	40	30	20	10	36
	10	10	20	30	40	40	40	50	40	30	20	-50	13
	40	40	40	40	40	40	40	50	40	30	30	20	-
	40	50	40	40	40	50	50	40	50	40	40	40	-
	30	20	20	30	20	10	10	10	10	10	10	20	24
	-10	-10	10	20	10	30	40	50	10	-10	0	0	8
	20	50	40	40	30	40	30	-40	30	30	40	40	26
OBS	40	40	40	100	80	50	70	80	60	50	40	40	-
	50	30	30	20	20	30	30	40	40	50	40	30	38
	40	50	60	60	60	60	40	40	30	20	10	20	-
	40	60	70	70	50	40	20	10	10	10	0	0	40
	60	50	40	60	60	70	70	80	30	100	120	100	63
	40	30	30	40	40	40	30	+S	+S	+S	OBS	OBS	-
	80	60	30	40	40	40	70	70	60	50	40	40	-
	40	40	40	40	30	40	40	40	30	30	30	20	38
	40	40	40	40	40	50	70	70	70	60	50	50	39
	40	40	50	40	40	40	50	70	60	50	40	40	39
	40	50	30	70	60	50	30	40	40	60	50	80	-
	40	50	50	30	20	30	20	0	+S	30	-50	10	55
	40	40	40	40	40	40	80	60	40	30	30	20	36
	30	20	20	10	10	0	0	-20	-30	-30	0	10	7
	40	40	40	40	40	50	40	40	40	40	30	20	33
	0	-10	-10	-10	-10	-10	10	40	40	-	-	-	-
	40	40	40	40	50	60	70	60	60	40	40	40	-
	60	50	50	50	80	120	80	40	30	60	40	40	50
	10	-20	-20	-30	10	30	40	50	90	60	0	10	31
	0	10	10	10	20	0	0	30	-30	-20	-10	-10	3

Date	00	01	02	03	04	05	06	07	08	09	10	11
021101	10	10	10	20	10	30	30	40	[60]	[90]	60	40
021102	10	10	10	10	10	10	10	[30]	10	-10	-30	-50
021103	60	60	70	80	80	70	70	[70]	60	40	40	40
021104	10	20	20	30	20	60	-	-	30	30	30	-60
021105	40	50	60	40	50	40	40	[30]	40	50	30	40
021106	70	70	70	70	70	50	40	[50]	40	60	50	60
021107	40	40	30	40	30	[30]	40	[30]	50	40	40	50
021108	30	40	40	30	20	10	30	[20]	-80	-70	0	20
021109	30	40	40	40	10	0	-10	[20]	20	-30	-90	-S
021110	20	OBS	30	40	30	30	40	[40]	40	40	40	40
021111	40	40	30	30	10	-	-	-60	-10	30	40	40
021112	60	50	40	30	30	40	70	[70]	-	70	50	40
021113	30	10	40	50	80	80	90	[70]	80	80	70	60
021114	10	20	30	40	30	40	40	[40]	40	40	40	40
021115	10	10	10	20	10	20	20	[30]	40	40	40	30
021116	10	20	20	30	20	30	30	[30]	30	30	30	20
021117	-10	0	10	20	20	30	30	40	[40]	40	40	40
021118	50	40	20	-30	-30	OBS	-	-	70	50	40	40
021119	80	70	80	70	100	70	40	0	30	40	40	50
021120	40	40	40	30	30	30	30	[40]	-	40	40	40
021121	60	70	100	80	80	140	120	80	50	10	[20]	40
021122	30	40	30	30	30	30	40	[50]	[40]	40	30	30
021123	40	30	30	30	30	20	20	30	-	-	-	-
021124	-	-	-	-	-	-	-	-	-	50	70	50
021125	30	20	20	0	30	20	-	[40]	-	40	30	40
021126	10	-10	10	10	10	30	20	[40]	30	30	30	40
021127	40	40	40	40	40	70	80	[80]	60	30	10	10
021128	-10	10	20	30	30	20	30	0	-10	0	-10	-10
021129	-10	-20	-20	-20	-30	-40	-30	[-40]	-10	-20	20	0
021130	0	30	40	40	40	60	70	[80]	50	20	10	10

12	13	14	15	16	17	18	19	20	21	22	23	mean
30	30	30	0	0	-10	0	10	-10	-10	-10	0	20
10	40	40	30	40	0	80	120	90	70	80	70	29
10	0	0	10	-20	-10	-40	-30	-10	-10	-10	10	27
-70	-60	-90	-10	30	40	30	80	10	20	30	20	-
30	40	50	50	60	60	80	80	80	60	50	60	50
70	70	80	60	50	60	70	70	70	40	40	30	59
50	50	50	40	30	20	30	30	30	40	40	40	38
40	40	40	40	40	40	40	40	60	50	40	40	25
-100	-20	30	40	40	30	70	60	50	50	30	20	16
40	50	40	60	90	80	80	80	40	60	50	40	48
50	80	80	90	OBS	50	130	130	90	80	80	70	-
40	40	40	40	20	10	10	-20	20	0	10	20	34
50	40	40	60	80	80	80	60	130	170	170	0	71
40	40	40	40	40	50	60	50	40	40	30	20	38
40	40	40	40	40	40	40	30	30	20	10	10	28
20	-10	-10	0	-10	10	10	20	30	-10	-40	-10	13
40	50	60	30	20	20	10	30	30	40	-10	20	27
20	10	10	10	10	30	60	90	50	40	70	70	-
40	50	60	50	40	40	50	40	30	10	30	0	46
40	30	30	40	40	60	50	70	80	50	60	60	44
40	50	40	40	40	40	60	50	60	50	40	40	58
40	OBS	20	70	70	OBS	OBS	80	60	50	50	60	-
-	-	-	-	-	-	-	-	-	-	-	-	-
50	70	50	40	40	50	60	50	40	40	40	30	-
40	30	10	20	10	10	20	0	10	20	20	30	-
40	50	40	40	50	40	40	40	30	30	20	20	29
10	30	40	40	30	20	40	50	40	40	20	20	38
-10	-10	-10	-10	-20	-10	0	10	-20	-20	-20	-10	-1
10	0	30	30	40	80	30	0	30	-50	+S	30	0
20	20	20	30	30	40	40	40	50	50	40	40	36

Date	00	01	02	03	04	05	06	07	08	09	10	11
021201	40	30	30	20	10	10	30	[40]	-	30	30	40
021202	20	30	20	20	10	0	10	20	-	10	20	30
021203	40	40	30	20	30	10	20	-30	0	10	10	10
021204	-10	10	20	30	10	10	40	[30]	10	20	20	20
021205	0	-30	-20	-30	-50	-60	10	[0]	10	-30	-60	-50
021206	-20	-20	-30	-10	-20	20	-10	30	10	20	30	30
021207	-10	-20	0	-10	-10	-10	0	0	0	-20	20	10
021208	-60	-20	-40	-70	-50	-40	-50	-70	-30	-10	0	20
021209	20	10	30	10	20	20	-	[50]	-	60	70	40
021210	40	40	40	30	30	20	10	[10]	-20	-20	0	20
021211	-10	0	10	10	10	10	20	[30]	30	20	30	40
021212	20	-10	-20	-40	-30	-10	-20	[-40]	[-50]	-40	-50	-30
021213	-10	-10	0	-20	-20	20	-10	[-20]	-10	0	80	70
021214	20	10	-10	20	50	80	60	[30]	20	20	10	-10
021215	-40	-30	-30	-30	-20	-30	-20	-20	[-10]	-10	-10	-10
021216	40	40	40	40	60	40	-	10	10	10	20	20
021217	-20	-20	-30	-30	-20	-10	-20	[-20]	-10	30	30	50
021218	80	90	90	90	70	80	80	[40]	40	30	10	10
021219	10	10	10	10	10	30	40	[60]	50	50	60	70
021220	40	40	30	20	10	10	10	[30]	[10]	40	40	10
021221	80	30	40	40	-S	-S	30	[40]	30	40	70	50
021222	70	30	-20	-10	20	30	30	30	[70]	[10]	-10	30
021223	50	160	140	80	70	90	-	100	40	40	80	130
021224	40	30	-10	-10	-10	-20	-10	[-30]	0	40	30	10
021225	50	60	40	40	40	40	[40]	40	40	20	40	60
021226	-20	-20	-20	-20	-50	-70	-40	[-60]	-30	-30	-30	-40
021227	-50	-50	-50	-50	-50	-50	-50	[-50]	-60	-50	-40	-30
021228	10	20	30	60	80	90	80	[80]	100	100	70	70
021229	-30	-20	30	10	30	100	100	90	140	260	180	80
021230	30	0	0	20	40	40	-	-	+S	+S	-S	50
021231	10	10	10	0	-10	-10	-30	-20	-10	30	50	50

12	13	14	15	16	17	18	19	20	21	22	23	mean
30	40	40	40	50	60	40	50	40	30	30	10	34
20	30	30	-40	-70	0	-10	20	10	10	-10	30	7
10	20	10	10	-10	-10	0	20	20	0	-20	-40	8
20	30	30	40	30	20	20	20	10	20	30	10	20
-60	-40	-10	40	20	-40	-40	-30	20	0	-10	-10	-20
20	10	10	10	0	-30	-10	10	10	30	20	10	5
0	30	0	-10	-10	-20	-10	-20	-50	-50	-60	-70	-13
50	50	20	-40	-10	-70	-30	-70	-50	40	20	-10	-22
50	50	50	40	30	30	30	20	30	40	40	40	-
20	30	30	20	20	10	10	0	10	20	10	-10	15
40	50	40	40	50	40	30	10	-20	20	0	10	21
-20	-20	-30	-10	-30	-10	-50	-50	-50	-50	-50	-50	-31
50	30	30	30	20	0	0	-20	-20	-10	10	30	10
-10	10	0	-20	-20	-30	-20	-30	-40	-50	-40	-50	0
-20	-30	-20	-10	-10	-10	10	20	30	30	30	40	-11
-10	20	70	30	40	-10	-20	-10	-10	-10	-10	-20	17
110	80	120	150	130	160	140	110	110	110	130	90	57
30	30	40	20	20	40	50	80	70	70	70	30	53
80	80	80	70	70	90	80	80	90	70	50	70	55
0	0	40	70	80	80	90	130	130	80	50	0	43
70	80	120	130	90	110	70	40	80	110	80	50	-
70	60	30	30	20	0	-20	-30	-30	-20	0	30	18
160	200	190	180	150	160	180	140	100	80	40	20	112
40	30	40	30	40	40	30	40	40	40	40	50	22
50	40	50	40	40	70	70	40	20	20	10	10	40
-50	-60	-30	-60	-50	-50	-60	-50	-60	-70	-70	-60	-46
-40	-40	-30	-40	0	40	50	70	60	60	50	30	-15
80	80	70	20	30	30	-10	-10	20	10	-10	-20	45
60	50	60	50	80	90	80	80	80	70	50	30	73
+S	-20	40	-20	20	10	20	30	30	20	10	10	-
40	30	50	50	50	50	50	60	50	60	50	60	28

*Hourly means of the
2003*

Date	00	01	02	03	04	05	06	07	08	09	10	11
030101	50	70	70	50	70	60	70	[70]	60	50	50	50
030102	-10	0	-50	-20	-40	-20	0	[0]	-10	-10	0	30
030103	30	20	30	30	20	20	30	20	30	30	[40]	40
030104	10	20	-20	-10	20	30	40	[40]	60	60	40	40
030105	70	70	0	0	-50	-40	20	[30]	30	30	20	40
030106	10	10	30	30	30	20	-	[30]	-	20	30	30
030107	70	70	80	80	70	-30	-20	-50	[-70]	-170	-80	-80
030108	30	10	10	10	30	30	10	10	[30]	60	70	70
030109	40	40	30	30	20	40	40	[60]	80	90	80	60
030110	-S	-S	-S	-30	-S	-30	-10	-10	-10	-10	-10	-20
030111	-30	-40	-50	-20	-10	0	20	[30]	40	80	100	100
030112	10	20	20	40	30	30	40	[40]	30	40	60	60
030113	50	40	40	40	40	30	-	-	-	-	70	60
030114	0	20	50	-10	-40	-40	0	-10	20	30	50	30
030115	60	40	40	30	40	40	30	[30]	40	50	60	60
030116	80	60	110	120	110	130	150	[120]	140	130	80	30
030117	30	40	30	30	30	40	40	[40]	50	60	60	20
030118	30	20	20	-30	-10	30	0	10	20	20	30	40
030119	80	80	80	80	80	80	100	[80]	80	40	20	40
030120	0	20	20	40	50	60	-	-	20	60	70	40
030121	-30	-30	-30	-40	-40	-20	-40	[-50]	-40	-30	-50	-70
030122	-70	-60	-90	-60	-50	-40	[-70]	-10	0	-70	-60	-80
030123	180	190	190	170	+S	+S	80	[130]	130	100	130	100
030124	10	20	20	10	30	40	60	[60]	60	30	20	30
030125	40	40	40	40	40	40	30	[40]	30	40	40	40
030126	60	40	30	30	20	30	20	30	[40]	50	50	40
030127	40	40	30	30	20	30	30	-	[40]	-	50	50
030128	50	70	40	50	60	50	70	[60]	60	70	60	50
030129	40	30	30	30	30	30	40	[50]	50	40	30	40
030130	40	40	40	40	40	40	50	[60]	60	50	-S	-30
030131	60	50	50	60	70	50	40	[30]	50	60	40	40

potential gradient

12	13	14	15	16	17	18	19	20	21	22	23	mean
50	50	40	40	50	40	40	40	30	0	-10	0	45
30	-	10	20	30	-S	-10	OBS	30	40	40	40	-
40	40	40	40	40	50	70	70	70	60	40	10	38
40	40	40	70	70	50	40	50	40	30	20	30	35
40	30	40	40	30	40	40	50	50	40	40	40	29
30	40	30	30	40	20	10	10	30	30	30	80	-
0	-60	-110	70	40	-S	-S	50	40	50	-S	-20	-
80	90	80	60	60	60	70	70	50	70	70	50	49
50	60	60	50	10	0	10	20	0	-10	-60	-140	-28
-10	-20	-20	-20	-50	-50	-160	-170	-60	-60	-50	-50	-
80	70	70	80	80	80	80	70	60	40	20	30	41
60	70	80	80	90	80	90	80	90	70	80	60	56
60	40	20	10	10	0	10	10	20	90	70	30	-
30	80	130	100	70	70	40	50	50	50	50	40	36
70	70	80	50	40	30	10	20	50	80	70	80	49
30	80	70	80	60	70	60	40	40	30	40	40	79
30	50	80	50	60	50	40	30	30	30	10	20	40
0	10	70	70	80	80	130	70	50	90	80	90	42
70	30	0	70	30	30	80	70	20	30	30	30	55
80	80	80	70	30	10	10	-20	-20	-30	-20	-30	-
-50	-40	-40	-60	-120	-130	-60	-80	-50	-40	-110	-100	-56
-50	40	80	100	80	90	80	80	130	140	130	180	18
120	110	30	-20	50	80	40	40	60	80	40	20	-
10	30	40	20	30	40	50	50	70	70	60	50	38
40	50	60	60	40	40	70	70	80	40	40	30	45
50	60	50	40	40	30	30	10	20	30	30	40	36
-S	-S	-S	-S	-S	50	70	100	80	70	70	70	-
40	-S	OBS	70	120	120	120	180	170	140	70	50	-
50	50	40	50	50	60	40	40	40	50	50	40	42
50	70	70	50	60	70	60	70	70	60	70	50	51
70	110	60	50	50	50	30	50	40	30	20	-20	48

Date	00	01	02	03	04	05	06	07	08	09	10	11
030201	-70	-20	-10	20	40	30	30	[30]	40	40	40	40
030202	50	50	50	50	70	40	40	[50]	60	70	50	50
030203	50	50	40	40	40	40	-	30	-	30	60	80
030204	20	-20	-10	-20	10	20	40	[40]	40	10	40	20
030205	40	30	10	10	0	-10	10	10	[30]	30	30	40
030206	-30	-40	-50	-50	-10	10	30	[30]	30	30	30	30
030207	-50	-50	-S	-S	-S	-20	10	[30]	40	50	40	50
030208	20	10	0	10	10	10	20	[40]	30	30	20	30
030209	30	30	10	20	10	30	40	40	[40]	40	40	40
030210	-40	-50	0	10	0	0	-	[20]	-	60	60	60
030211	-10	0	-10	-S	-20	-10	-10	[0]	10	20	20	10
030212	-10	-20	10	30	30	40	50	[60]	50	70	80	70
030213	30	40	50	40	50	40	60	[80]	80	80	70	70
030214	40	40	40	30	20	30	40	[50]	60	50	50	60
030215	40	40	40	40	40	60	60	[60]	50	50	50	60
030216	-30	-40	-50	-40	10	20	30	[20]	30	40	40	40
030217	40	50	30	10	20	10	-	-	-	60	70	60
030218	30	40	40	40	30	10	20	[40]	40	50	60	70
030219	20	30	30	30	20	40	40	[30]	-10	-60	-20	10
030220	40	50	30	40	20	20	0	[-10]	-10	20	30	30
030221	40	50	60	50	50	-10	10	[30]	10	20	30	40
030222	40	40	30	30	30	20	40	[40]	40	40	40	30
030223	20	20	30	20	20	30	30	[40]	30	30	40	50
030224	70	70	60	130	130	140	-	[130]	-	120	120	90
030225	70	70	80	80	90	110	130	[90]	80	70	40	30
030226	20	-10	-10	-10	-20	-30	-10	[-10]	-10	-10	10	30
030227	-70	-40	-70	-80	-30	-20	-40	[-30]	0	20	30	40
030228	50	40	30	30	50	50	50	[50]	70	60	50	60

12	13	14	15	16	17	18	19	20	21	22	23	mean
30	30	40	50	50	50	50	70	60	50	50	50	33
50	50	50	40	40	40	50	40	50	50	40	50	49
90	90	90	80	70	80	70	80	60	40	30	30	-
-10	30	40	30	30	40	30	40	70	40	30	30	25
40	40	40	30	30	30	30	40	40	40	30	20	27
30	40	40	40	40	40	30	10	30	30	10	-10	14
50	60	50	50	80	70	50	40	30	30	30	30	-
20	30	50	60	60	50	60	60	50	40	40	30	33
40	40	40	40	40	40	30	10	-10	-10	0	20	27
60	60	60	70	50	80	50	40	30	30	40	0	-
0	-10	20	30	40	10	-10	-10	-20	0	40	20	5
70	70	70	70	60	60	50	50	40	40	40	40	47
80	70	60	50	40	60	50	60	70	40	50	40	57
40	40	40	40	80	60	60	80	70	40	40	40	48
60	60	60	70	40	-10	-10	-10	-10	0	-10	-40	33
30	40	60	60	60	50	40	70	70	40	40	40	28
70	70	60	60	80	60	70	60	50	40	40	40	-
80	90	80	80	80	80	80	50	30	10	0	20	48
30	50	50	60	60	70	60	70	60	60	60	40	35
30	50	40	50	50	70	70	40	50	50	40	30	35
50	70	50	40	40	40	40	40	40	40	40	40	38
40	40	30	40	40	30	40	40	10	20	20	30	33
50	40	40	40	40	20	0	30	60	60	50	70	36
90	90	90	90	80	80	80	80	80	90	80	40	-
40	40	40	40	40	40	50	50	40	40	40	30	60
40	40	40	10	-10	-10	-10	-10	-10	0	-50	-70	-4
50	50	40	30	20	30	50	60	30	20	30	30	6
50	50	40	40	60	40	70	70	80	90	80	70	55

Date	00	01	02	03	04	05	06	07	08	09	10	11
030301	60	80	50	40	30	40	50	[50]	70	80	80	80
030302	40	40	40	40	40	40	40	[40]	50	40	40	50
030303	-70	+S	30	30	30	-30	-	-10	-	-60	-10	-10
030304	50	60	60	60	50	70	70	[60]	50	40	30	30
030305	40	40	30	40	70	80	-	[80]	80	60	70	40
030306	30	30	10	10	20	30	60	60	[60]	60	60	70
030307	-10	-20	0	0	-10	-10	-10	[-10]	-20	-40	-20	-10
030308	-10	10	30	40	40	20	30	[40]	50	40	40	30
030309	30	20	10	10	20	10	20	[30]	20	30	20	30
030310	30	30	20	20	30	40	-	[40]	-	40	40	40
030311	10	30	30	30	20	10	30	[40]	40	40	40	40
030312	10	0	0	10	20	20	40	[40]	30	40	30	20
030313	30	30	20	20	+S	OBS	30	[40]	40	30	40	30
030314	0	0	10	10	-40	-50	-30	[-10]	0	10	10	10
030315	40	40	50	50	50	50	60	[60]	50	60	60	50
030316	60	50	50	40	50	30	40	[60]	40	40	30	40
030317	40	40	40	40	30	40	-	[50]	-	50	60	70
030318	40	30	30	30	40	40	40	[40]	40	40	40	40
030319	40	40	30	30	30	40	40	[40]	40	40	40	40
030320	30	50	30	30	30	40	40	[40]	40	40	50	50
030321	40	40	20	30	40	70	70	[70]	80	80	70	60
030322	40	40	40	40	40	40	40	[40]	40	30	40	40
030323	40	40	30	40	30	40	40	[50]	50	60	60	70
030324	50	-	-	-	-	-	-	-	-	50	70	70
030325	20	10	20	20	30	30	30	[40]	40	40	50	40
030326	40	40	40	40	30	30	40	40	[40]	40	50	40
030327	30	30	20	10	10	30	40	[40]	30	30	20	30
030328	10	20	20	20	20	20	30	[30]	40	40	40	40
030329	20	20	10	20	20	20	30	40	40	40	40	[40]
030330	20	20	30	20	20	20	[20]	10	10	30	30	40
030331	10	20	10	10	10	-	[20]	[40]	40	40	40	40

12	13	14	15	16	17	18	19	20	21	22	23	mean
80	70	80	70	80	80	70	30	40	40	30	30	59
60	70	70	50	40	40	40	30	30	30	30	-10	41
-10	30	40	40	40	40	40	40	30	30	30	40	-
40	60	60	70	70	80	80	80	80	70	70	50	60
40	50	50	60	40	60	70	60	60	50	50	30	53
70	70	40	40	20	10	-10	-10	-10	-10	-10	-10	29
-10	-10	-10	-10	-10	10	30	40	30	20	20	10	-2
30	30	40	40	40	50	60	40	30	20	10	10	32
20	10	30	40	40	30	-20	20	10	10	10	30	20
40	40	40	50	40	40	20	30	10	10	20	10	-
40	40	30	20	20	30	20	10	10	30	40	30	28
20	20	10	10	30	30	40	40	40	40	40	30	25
20	20	40	40	40	40	40	40	20	0	0	10	-
10	0	0	0	-10	0	-50	-110	-50	20	20	30	-9
50	50	50	50	40	40	50	70	70	70	60	50	53
40	40	40	40	40	50	50	50	50	60	50	50	45
60	60	70	70	50	40	40	50	40	40	40	40	-
40	50	50	50	50	50	60	50	50	40	40	40	43
50	50	40	40	40	40	40	40	40	40	30	40	39
50	50	50	50	50	50	40	50	50	50	40	40	43
70	60	70	80	80	80	120	110	110	110	50	40	69
50	60	60	70	60	50	50	50	50	50	50	40	46
80	80	110	80	80	70	70	60	70	80	60	50	60
60	60	50	40	30	50	50	50	40	40	30	30	-
50	50	50	50	50	50	70	50	40	40	40	30	39
40	50	40	40	30	30	40	40	40	30	30	30	38
30	20	20	30	20	20	10	10	10	10	10	10	22
40	40	40	40	40	40	40	30	20	20	20	10	30
40	50	40	40	30	40	30	30	40	30	30	20	32
40	30	30	30	OBS	-S	20	40	20	20	20	10	-
50	40	40	40	40	50	60	60	60	60	40	40	37

Date	00	01	02	03	04	05	06	07	08	09	10	11
030401	30	30	20	20	30	40	(30)	[40]	30	30	30	30
030402	30	30	30	30	40	40	[40]	[30]	30	30	30	30
030403	-	-	-	-	-	-	0	10	20	30	30	40
030404	30	30	30	30	30	30	40	[40]	30	30	30	20
030405	30	30	30	20	10	30	40	30	[30]	30	40	30
030406	20	30	30	40	40	40	[50]	50	40	OBS	OBS	OBS
030407	40	30	30	-	-	-	-	-	30	30	+S	+S
030408	80	10	20	30	10	20	[30]	40	40	40	40	40
030409	30	30	30	10	20	30	[40]	30	30	30	40	40
030410	30	30	20	20	10	10	[30]	[20]	30	20	30	20
030411	20	40	30	10	30	40	[10]	30	30	-10	10	30
030412	40	30	30	40	30	30	[30]	40	40	30	30	30
030413	-10	0	20	20	30	30	[40]	40	40	50	50	50
030414	30	30	20	20	20	-	-	-	30	40	40	40
030415	20	30	20	20	20	30	40	[30]	20	30	40	40
030416	10	10	20	20	20	20	[40]	30	30	40	50	50
030417	30	30	20	20	20	30	30	[30]	40	30	40	40
030418	30	30	30	30	30	30	20	[20]	30	30	40	40
030419	OBS	OBS	30	20	10	10	[20]	30	40	40	40	40
030420	30	30	30	30	20	[20]	30	30	20	20	20	30
030421	20	30	30	30	30	30	30	[30]	30	30	20	20
030422	10	10	10	10	20	20	-	-	40	40	40	40
030423	10	10	20	10	10	10	10	[10]	10	-10	OBS	OBS
030424	20	30	20	30	30	40	[40]	20	20	30	30	20
030425	20	20	20	20	20	20	[40]	40	40	40	40	40
030426	10	10	10	10	10	20	20	[20]	20	20	20	20
030427	30	30	30	10	0	10	-10	0	[10]	20	30	0
030428	40	30	30	20	30	-	-	-	30	30	40	40
030429	30	40	40	30	30	40	40	[40]	40	40	40	40
030430	30	30	20	20	30	30	[30]	[30]	30	30	40	30

[illegible]

Date	00	01	02	03	04	05	06	07	08	09	10	11
030501	30	30	30	20	10	10	[20]	30	+S	+S	20	30
030502	30	20	20	20	10	30	[30]	[30]	40	40	50	40
030503	40	30	40	30	20	20	[20]	20	20	10	10	-20
030504	20	20	20	20	20	[30]	30	40	30	40	40	40
030505	30	30	30	30	40	-	20	-	30	30	40	40
030506	30	30	20	30	20	30	[40]	40	40	40	50	50
030507	20	20	10	10	20	30	[30]	30	30	40	40	40
030508	10	10	10	0	0	20	[20]	30	40	50	60	60
030509	10	20	10	10	10	10	30	[30]	30	40	40	40
030510	30	30	20	20	20	30	[20]	20	30	20	30	30
030511	+S	OBS	OBS	OBS	20	30	OBS	[40]	-10	-10	30	30
030512	20	30	20	20	20	-	[30]	-	30	30	40	+S
030513	OBS	-S	-10	10	10	10	30	[20]	30	20	10	10
030514	10	20	OBS	OBS	20	30	[10]	0	0	10	10	10
030515	10	10	0	0	0	10	[10]	20	20	20	20	30
030516	10	30	20	10	20	30	30	[40]	40	40	40	40
030517	20	20	10	20	20	10	[10]	10	10	10	10	10
030518	10	10	10	10	10	10	[10]	20	20	30	20	0
030519	20	20	10	20	20	-	[10]	-	-	30	30	30
030520	10	20	20	20	20	10	[10]	10	10	0	-20	30
030521	0	10	10	0	0	-20	30	[30]	30	10	0	0
030522	-10	-10	10	-20	-10	-10	-10	-10	-10	0	10	10
030523	20	10	10	0	10	20	30	30	[30]	40	50	40
030524	20	20	30	30	30	40	[30]	30	30	40	40	40
030525	20	20	20	10	10	30	30	[30]	20	30	30	40
030526	10	10	10	10	20	-	-	20	20	30	30	30
030527	10	20	OBS	OBS	40	40	[20]	10	10	20	30	40
030528	0	-10	0	10	-10	-10	-10	-10	0	10	20	30
030529	OBS	OBS	OBS	OBS	-	-20	[50]	120	30	30	40	40
030530	30	30	20	30	30	40	[40]	[30]	30	30	40	40
030531	10	10	10	20	20	30	30	[20]	10	20	30	40

12	13	14	15	16	17	18	19	20	21	22	23	mean
40	40	40	40	30	30	30	40	40	30	30	30	-
40	40	40	40	30	40	40	40	30	40	40	40	34
20	OBS	20	40	40	40	40	40	30	30	30	20	26
40	40	50	40	40	40	40	30	30	30	30	30	33
40	40	50	40	50	40	30	30	30	30	20	20	-
50	50	50	50	40	40	40	30	30	30	30	20	37
50	50	40	40	40	40	30	30	20	30	10	20	30
70	70	60	50	40	40	40	30	30	40	40	30	35
40	40	30	20	-30	-10	40	40	20	10	20	20	22
40	30	20	70	30	10	10	10	10	20	+S	+S	-
20	40	40	40	50	50	30	40	30	10	10	10	-
OBS	OBS	50	30	50	50	20	-S	-S	OBS	OBS	OBS	-
10	20	20	20	-S	-20	-S	10	0	10	20	10	-
10	10	0	0	0	10	20	30	20	30	10	10	-
30	30	30	30	30	30	40	40	40	30	30	30	23
40	40	40	40	30	30	30	30	20	30	20	20	30
10	20	20	20	20	10	10	10	10	10	10	10	13
OBS	-S	OBS	-S	OBS	40	30	30	30	30	30	30	-
40	40	40	20	20	20	10	10	10	10	10	10	-
-10	-10	30	-40	-50	30	10	-20	-20	-10	-10	-10	1
0	0	0	10	0	0	-20	-30	-30	-20	-40	-S	-1
10	20	30	30	30	40	30	30	20	10	10	10	9
40	40	40	60	60	50	40	40	30	30	20	20	9
40	40	40	40	30	40	40	40	30	20	20	20	33
40	40	50	40	40	30	30	20	10	10	10	10	26
40	20	30	30	10	-S	-S	-20	OBS	30	30	10	-
40	40	40	40	40	50	40	40	30	30	20	0	-
30	40	40	30	60	OBS	-S	30	20	0	0	OBS	-
40	50	60	70	30	10	20	20	30	20	20	20	-
50	50	50	40	40	40	30	30	30	20	30	20	34
40	40	40	30	40	30	30	20	10	OBS	10	-S	-

Date	00	01	02	03	04	05	06	07	08	09	10	11
030601	OBS	OBS	OBS	30	30	30	80	70	50	40	30	OBS
030602	10	10	10	10	10	–	–	[60]	40	40	40	30
030603	10	10	10	20	20	30	[30]	30	40	40	40	40
030604	0	0	10	10	10	30	[30]	20	20	30	30	40
030605	30	20	20	10	10	20	[30]	[30]	30	30	30	40
030606	20	20	20	20	20	30	[30]	20	20	30	40	40
030607	40	30	30	30	30	20	[30]	40	40	50	60	50
030608	10	10	10	10	20	30	30	[30]	30	30	30	30
030609	10	10	10	10	10	–	–	10	0	10	20	30
030610	10	10	10	20	30	30	[40]	[40]	40	40	40	40
030611	20	20	20	20	20	30	[30]	[40]	30	70	80	70
030612	30	30	20	30	30	40	40	[40]	40	50	60	60
030613	10	OBS	OBS	30	10	30	[70]	80	60	50	40	40
030614	30	30	20	20	30	80	90	[80]	80	70	80	60
030615	–	–	–	–	–	–	–	80	70	70	70	60
030616	0	0	20	20	20	30	[40]	–	30	OBS	OBS	100
030617	20	10	20	20	20	30	30	[40]	60	40	40	40
030618	10	10	10	10	10	20	20	–40	0	10	OBS	OBS
030619	40	30	30	30	40	40	40	[40]	60	30	30	30
030620	30	30	20	20	30	20	[40]	30	40	40	30	20
030621	30	40	20	30	30	20	40	[40]	40	40	40	40
030622	40	40	30	20	20	30	40	[40]	40	40	40	40
030623	20	30	30	30	–	–	–	–	60	60	60	70
030624	30	20	10	OBS	30	10	[40]	20	20	30	OBS	OBS
030625	20	20	30	20	30	40	[40]	40	40	40	50	40
030626	30	40	40	30	30	40	[40]	40	40	50	60	60
030627	20	30	30	20	30	[20]	20	30	30	40	40	40
030628	10	10	0	0	10	20	[30]	30	40	50	50	50
030629	10	10	10	10	20	20	[30]	30	30	30	30	30
030630	30	30	20	20	30	–	20	30	30	40	40	40

12	13	14	15	16	17	18	19	20	21	22	23	mean
OBS	OBS	+S	20	40	10	10	10	0	20	10	10	-
30	40	40	50	30	30	20	10	10	0	10	10	-
50	50	60	40	40	30	30	20	10	10	10	0	28
40	40	50	50	40	40	40	40	30	30	30	30	29
40	50	60	50	50	50	40	40	40	40	30	30	34
50	60	60	80	100	30	50	40	30	30	30	40	38
60	50	60	70	50	40	40	30	20	20	10	10	38
40	40	40	30	30	40	20	10	10	10	10	10	23
40	40	40	40	40	40	20	30	20	10	10	10	-
50	50	60	70	50	50	40	40	30	30	30	20	36
70	80	90	80	60	20	20	30	20	30	30	30	42
50	60	70	80	40	40	30	20	10	10	10	10	38
50	80	80	OBS	OBS	OBS	OBS	OBS	10	30	10	30	-
70	80	80	80	70	60	40	40	40	30	OBS	-	-
30	30	40	40	30	30	20	20	0	0	-10	0	-
60	40	40	40	40	40	40	40	30	30	20	10	-
40	40	40	40	40	40	30	20	30	20	10	10	30
-S	30	40	40	40	40	40	40	40	40	30	40	-
30	30	30	30	30	20	40	40	30	40	40	40	35
30	60	60	30	30	40	30	20	20	10	OBS	-S	-
40	40	60	60	60	70	70	60	40	40	40	40	43
40	60	60	80	80	70	60	40	40	30	20	20	43
80	80	80	90	80	+S	OBS	-S	OBS	20	30	30	-
80	60	60	70	30	OBS	30	30	30	20	20	20	-
40	40	40	40	40	50	50	50	70	70	60	40	42
50	50	50	50	40	40	40	40	30	30	30	30	41
40	40	40	40	40	20	10	20	20	30	30	20	29
40	40	40	50	40	30	30	30	20	10	10	10	27
40	40	40	40	40	40	40	40	40	40	40	40	31
50	40	40	40	40	40	40	40	30	30	20	20	33

Date	00	01	02	03	04	05	06	07	08	09	10	11
030701	10	10	10	10	10	10	10	[10]	20	30	–	40
030702	20	10	10	10	30	30	50	80	70	[30]	30	20
030703	20	20	10	OBS	OBS	30	60	[70]	[40]	40	50	60
030704	30	40	40	40	40	40	40	[40]	40	30	30	110
030705	20	–20	30	30	50	80	[60]	[40]	40	30	30	30
030706	10	20	10	OBS	10	10	[30]	[30]	30	30	20	20
030707	30	20	20	30	30	–	50	[40]	40	–	[50]	40
030708	30	30	30	30	30	40	[50]	60	50	50	40	40
030709	20	10	10	10	10	20	[40]	[40]	40	50	40	40
030710	40	40	30	30	40	40	[40]	40	40	40	40	40
030711	20	20	10	20	30	40	[60]	70	50	50	50	40
030712	10	10	20	20	20	30	40	40	40	20	10	30
030713	10	10	30	30	40	30	60	[40]	40	10	30	30
030714	30	30	20	20	20	–	40	–	50	40	50	40
030715	10	10	10	20	20	30	[30]	40	40	50	50	50
030716	20	20	20	20	30	30	[30]	20	20	30	30	40
030717	+S	OBS	–S	20	20	30	[20]	OBS	+S	70	130	80
030718	50	40	10	30	30	30	[40]	40	40	40	40	40
030719	40	40	40	40	40	40	[40]	[40]	40	40	40	40
030720	20	20	20	10	20	30	30	40	[40]	50	50	60
030721	20	20	10	10	20	–	–	–	20	30	40	40
030722	10	10	10	10	OBS	–S	[30]	90	80	90	80	70
030723	–S	OBS	OBS	+S	10	30	[30]	40	40	40	30	–20
030724	40	20	20	10	10	20	[30]	30	20	40	40	40
030725	–40	60	–S	OBS	OBS	+S	[30]	90	110	60	40	30
030726	20	10	10	20	30	30	[40]	40	40	60	70	70
030727	20	20	10	20	10	20	30	[30]	30	30	40	40
030728	40	40	30	30	30	–	–	–	20	20	30	30
030729	50	40	30	50	70	50	50	40	40	50	40	[40]
030730	30	30	30	30	30	[40]	40	50	30	40	30	0
030731	30	30	20	10	10	10	10	10	[20]	20	30	30

12	13	14	15	16	17	18	19	20	21	22	23	mean
40	40	40	-S	-50	-30	-10	10	10	40	OBS	OBS	-
20	40	40	40	40	40	30	30	30	30	30	30	33
60	70	-S	OBS	OBS	OBS	-S	30	40	30	10	20	-
OBS	OBS	OBS	30	10	10	10	-10	-10	30	30	20	-
40	40	30	40	40	40	40	30	30	30	20	20	34
30	30	40	40	50	40	40	40	40	30	30	30	29
50	50	40	40	40	40	40	40	40	30	20	30	-
40	50	50	50	50	50	40	40	30	30	30	20	40
40	40	OBS	40	70	OBS	50	50	50	50	50	40	-
40	40	50	40	40	40	OBS	0	-10	30	20	30	34
40	50	40	50	40	40	40	30	20	20	20	20	36
30	-S	-S	OBS	-40	10	10	+S	OBS	OBS	30	20	-
10	0	0	30	30	30	30	20	20	20	20	20	25
50	50	60	60	50	50	40	40	40	30	30	10	-
50	50	60	70	50	40	30	30	20	30	20	20	35
40	40	40	40	30	30	30	30	20	20	30	20	28
60	50	50	40	40	40	20	OBS	OBS	OBS	OBS	-S	-
40	40	30	40	40	40	50	60	40	40	40	40	39
40	40	40	40	40	40	40	30	30	20	20	20	37
60	60	60	60	50	40	30	30	30	20	10	10	35
60	70	60	40	30	40	30	30	OBS	-	10	10	-
70	70	80	90	40	30	30	30	30	+S	OBS	+S	-
-S	30	40	40	40	40	40	40	40	40	30	30	-
60	40	40	40	30	30	40	30	20	10	0	30	29
40	40	40	40	30	40	40	40	40	40	20	30	-
70	80	70	80	60	40	40	40	30	20	20	20	42
40	60	60	60	40	40	40	60	60	60	60	40	38
30	30	40	30	30	30	+S	OBS	OBS	OBS	0	30	-
30	30	30	30	30	30	30	40	40	40	40	30	40
20	30	50	50	40	40	40	40	30	50	40	30	35
30	30	40	OBS	OBS	10	50	40	-10	40	40	30	-

Date	00	01	02	03	04	05	06	07	08	09	10	11
030801	30	20	20	20	OBS	50	[70]	70	70	50	50	40
030802	30	30	30	30	30	40	40	[40]	40	50	50	50
030803	10	10	10	10	10	20	30	[20]	30	40	40	50
030804	10	10	10	10	10	20	20	–	–	30	40	50
030805	20	20	10	10	30	70	[40]	[80]	80	70	80	70
030806	20	20	10	10	10	20	[30]	[30]	30	40	40	50
030807	20	30	20	20	30	30	[40]	50	60	60	70	60
030808	10	10	10	20	20	20	[30]	40	40	40	40	50
030809	10	20	20	10	20	30	[40]	40	40	50	60	50
030810	20	10	10	10	10	20	[20]	40	40	50	60	70
030811	20	10	10	20	20	30	–	–	70	60	40	40
030812	10	10	20	10	10	20	[30]	40	40	40	40	40
030813	20	10	10	10	10	10	[10]	[20]	30	20	30	40
030814	10	10	10	10	20	20	30	40	[40]	40	50	60
030815	10	+S	+S	20	20	20	[40]	30	40	OBS	OBS	90
030816	30	30	20	20	20	20	[20]	30	30	30	40	40
030817	20	20	30	30	20	30	30	30	[40]	40	40	40
030818	20	20	20	20	20	–	–	[40]	40	40	50	50
030819	30	20	30	20	10	30	[40]	40	40	30	20	30
030820	10	20	20	10	20	20	[30]	40	30	40	40	50
030821	20	20	20	10	20	10	20	[30]	30	30	40	70
030822	20	10	10	10	10	20	[20]	30	30	40	50	60
030823	30	30	30	30	30	30	[40]	40	40	40	50	40
030824	30	30	30	30	30	30	[30]	40	40	40	40	40
030825	10	10	20	10	20	–	–	–	40	40	50	40
030826	40	30	30	30	30	20	[30]	40	40	40	40	50
030827	20	10	10	10	10	10	[20]	20	20	20	30	40
030828	30	20	20	20	20	20	[20]	30	40	40	40	40
030829	30	30	20	10	10	20	[–50]	–20	–40	20	20	–S
030830	40	40	40	20	20	30	[40]	80	60	50	40	40
030831	40	20	20	20	0	20	OBS	–S	+S	OBS	OBS	OBS

12	13	14	15	16	17	18	19	20	21	22	23	mean
50	50	50	50	50	50	50	40	40	40	40	40	45
60	50	60	60	50	40	30	20	10	10	10	10	36
50	60	60	60	50	40	30	20	20	20	20	20	30
60	60	50	-S	OBS	-S	0	0	0	10	20	20	-
60	60	50	40	40	40	30	30	30	30	20	20	46
50	50	50	40	50	40	30	30	30	40	30	30	33
60	60	50	40	40	40	30	30	10	20	10	10	37
70	60	70	70	50	30	30	10	10	10	10	20	32
50	60	40	40	40	40	30	30	30	20	10	20	33
60	50	50	40	40	30	20	20	20	20	20	20	31
40	40	40	40	40	40	30	30	40	40	40	20	-
40	50	50	40	30	20	10	10	10	10	10	10	25
50	40	60	60	30	30	30	30	10	+S	10	10	25
+S	OBS	OBS	-S	30	40	30	30	30	30	30	20	-
40	40	40	40	40	30	20	30	30	30	20	20	-
40	30	30	30	20	30	30	20	30	20	30	20	28
50	50	50	OBS	OBS	OBS	-S	30	30	30	30	30	-
70	60	60	60	30	+S	OBS	30	40	40	40	40	-
30	30	40	40	40	40	40	40	40	40	20	10	31
60	60	60	60	60	50	40	40	40	30	20	20	36
50	40	40	40	40	30	20	10	10	10	10	10	26
60	60	60	60	60	50	50	40	40	40	30	40	38
50	40	40	50	60	40	40	40	40	30	40	30	39
40	40	40	30	40	30	20	20	30	30	10	10	31
40	40	50	40	40	40	40	40	30	30	30	30	-
40	50	60	50	50	40	40	30	30	20	20	20	36
40	50	50	50	50	40	40	40	40	60	70	50	33
30	30	40	30	40	40	40	30	30	30	30	30	31
-S	-S	OBS	OBS	OBS	OBS	OBS	OBS	OBS	OBS	OBS	OBS	-
40	40	40	40	50	OBS	OBS	OBS	OBS	+S	OBS	OBS	-
OBS	OBS	40	30	30	40	30	40	40	40	30	30	-

Date	00	01	02	03	04	05	06	07	08	09	10	11
030901	30	30	20	20	20	–	–	80	70	60	50	40
030902	30	20	20	20	20	30	[30]	OBS	40	30	20	20
030903	20	10	10	10	20	20	30	[40]	40	50	40	40
030904	10	20	20	20	10	20	[20]	30	40	40	40	40
030905	10	20	10	10	20	20	[30]	40	–S	40	40	40
030906	10	10	10	10	10	[10]	20	20	20	30	40	40
030907	30	30	20	10	10	10	[10]	10	10	10	30	40
030908	30	30	30	20	30	–	–	40	30	30	30	40
030909	10	10	20	0	10	[10]	20	70	30	40	20	30
030910	30	40	20	0	–10	0	10	[10]	0	10	60	30
030911	20	20	20	20	30	30	[20]	40	40	50	20	30
030912	30	30	30	30	30	40	[40]	40	40	30	30	40
030913	30	20	20	10	20	20	20	30	30	20	10	30
030914	30	30	40	40	30	40	[40]	60	50	60	60	60
030915	40	30	40	40	40	–	40	50	40	40	40	40
030916	20	20	30	20	30	30	[40]	30	40	40	40	40
030917	20	30	30	30	[40]	30	30	30	40	40	40	50
030918	30	30	30	30	30	20	[30]	–	30	40	70	60
030919	20	20	30	30	30	30	[30]	30	30	30	40	40
030920	20	30	30	20	30	30	[40]	40	40	40	40	40
030921	30	40	30	20	20	30	40	[40]	40	40	40	40
030922	30	30	40	40	40	–	–	–	40	40	40	40
030923	30	30	30	20	30	30	[40]	[40]	40	40	40	40
030924	OBS	–10	0	OBS	20	50	[70]	70	60	40	30	20
030925	40	40	40	40	40	40	40	[40]	40	50	50	50
030926	20	10	10	20	20	20	40	[30]	40	30	40	40
030927	20	20	30	30	30	40	[40]	30	40	40	30	40
030928	30	20	10	10	10	30	[30]	30	30	30	30	30
030929	30	30	20	10	20	–	–	–	10	–70	–90	–70
030930	30	30	30	30	20	40	[40]	70	60	70	50	40

12	13	14	15	16	17	18	19	20	21	22	23	mean
40	40	40	40	30	20	OBS	30	30	30	30	30	–
–S	40	–20	30	30	40	40	40	40	40	30	20	27
40	40	40	40	40	30	30	40	30	30	30	10	30
40	40	40	40	40	30	30	40	30	30	20	10	29
40	40	40	40	40	20	20	20	10	10	10	20	26
40	40	40	40	40	40	40	40	30	30	30	30	28
40	40	30	30	40	30	30	30	30	40	30	30	26
40	40	40	40	40	40	40	40	40	40	30	20	–
70	40	40	40	20	20	30	40	30	40	30	30	29
–50	40	30	0	10	20	10	10	20	30	30	20	15
20	20	30	30	40	40	40	30	30	40	40	40	31
30	30	30	20	10	30	30	–10	–10	30	20	30	27
[20]	10	10	10	30	30	20	30	30	30	40	30	23
50	50	50	40	40	40	40	40	50	40	50	40	45
50	50	50	50	40	50	60	40	30	30	20	20	40
50	50	40	40	40	40	40	40	40	30	30	20	35
60	60	70	50	40	50	60	50	40	40	40	30	42
60	80	80	40	40	40	40	30	30	20	20	20	39
40	40	40	40	40	40	40	30	40	40	30	30	34
50	50	40	40	40	40	40	40	40	40	40	40	38
40	50	40	50	40	40	40	40	40	40	40	40	38
30	40	40	40	40	40	40	40	40	40	40	30	–
50	50	40	40	40	+S	OBS	40	40	20	0	–10	–
10	30	40	40	40	50	40	60	60	50	40	40	–
50	50	40	40	40	40	40	40	30	30	30	20	40
40	40	30	30	30	40	40	40	30	30	30	30	30
40	40	40	40	40	40	40	40	40	40	40	40	36
40	30	30	40	40	40	40	40	30	30	30	30	30
–90	–20	0	0	30	30	30	40	40	50	50	40	–
40	40	40	40	40	30	30	40	40	40	30	30	40

Date	00	01	02	03	04	05	06	07	08	09	10	11
031001	30	20	10	10	10	20	[30]	20	20	20	20	30
031002	30	40	40	40	40	40	[40]	40	40	40	40	40
031003	20	20	10	10	10	10	20	[30]	30	30	40	40
031004	20	20	0	30	40	[30]	0	OBS	OBS	80	130	40
031005	-S	-S	-S	-S	OBS	-S	70	-20	-S	40	30	10
031006	20	20	20	20	30	-	-	-	30	20	20	30
031007	30	40	30	30	30	30	[30]	20	30	30	20	10
031008	10	10	10	30	30	30	40	[40]	40	30	30	30
031009	-60	-S	-S	-10	10	30	[40]	30	40	10	OBS	OBS
031010	20	10	10	10	20	0	[-10]	[10]	10	20	40	40
031011	30	30	20	20	30	20	[10]	20	40	30	30	30
031012	30	30	30	30	30	30	[10]	20	30	40	40	30
031013	40	40	30	30	40	-	-	-	30	30	30	30
031014	20	20	20	20	30	30	[30]	40	40	40	40	40
031015	20	20	20	20	20	30	[30]	40	40	40	40	40
031016	30	30	20	20	30	30	[40]	30	40	30	20	30
031017	20	20	20	20	20	20	[30]	-	-	-	-	70
031018	30	30	10	10	10	0	-10	-10	0	10	20	30
031019	10	10	0	0	10	0	0	10	10	10	20	20
031020	0	-10	0	10	0	-	-	-	10	0	10	40
031021	40	40	40	40	30	30	[30]	50	30	40	40	20
031022	40	30	30	20	20	20	[10]	30	20	20	30	40
031023	30	30	30	30	30	30	[40]	40	40	40	40	40
031024	-	-	-	-	-	-	-	-	-	-	-	-
031025	40	40	30	30	30	30	[20]	[40]	40	40	50	50
031026	30	20	20	10	10	10	20	[30]	30	40	50	50
031027	40	40	40	30	30	30	-	-	[40]	40	40	30
031028	30	30	40	20	30	40	40	[50]	40	40	40	40
031029	-40	-60	-80	-60	-70	-60	-40	[-60]	-60	-60	-60	-40
031030	0	-10	0	0	0	10	20	20	30	20	30	40
031031	10	20	30	30	40	30	40	[20]	30	40	40	40

12	13	14	15	16	17	18	19	20	21	22	23	mean
30	30	30	30	20	20	30	30	30	40	30	40	25
40	40	40	30	30	30	30	20	30	20	20	20	34
40	40	40	40	30	30	40	30	-10	OBS	OBS	40	-
40	40	40	40	40	40	40	40	30	40	30	OBS	-
20	OBS	-10	30	30	20	0	+S	30	20	30	20	-
30	20	30	40	40	40	40	40	30	30	30	30	-
20	30	30	40	30	30	40	40	40	-S	OBS	0	-
40	30	30	40	30	40	40	40	40	30	20	-10	29
OBS	OBS	OBS	40	40	10	40	40	40	40	40	30	-
50	50	50	50	50	70	70	60	60	60	40	30	34
30	30	30	30	20	30	40	40	40	40	30	30	29
40	40	40	40	40	40	40	50	40	40	40	40	35
40	40	40	40	40	40	40	40	30	20	10	20	-
40	50	40	40	30	30	40	50	40	40	30	30	35
40	40	40	30	40	40	40	40	40	40	30	30	34
OBS	-S	30	40	40	40	40	40	30	30	40	30	-
70	60	60	50	60	70	40	40	40	40	30	30	-
20	[30]	40	30	30	20	20	10	10	20	10	10	16
20	30	30	30	30	30	30	20	30	20	30	20	18
40	30	-60	-S	30	50	50	40	40	50	40	40	-
30	OBS	-30	20	30	30	30	40	30	20	30	30	30
50	40	50	30	30	40	40	40	30	30	40	40	32
40	40	0	10	OBS	OBS	OBS	-S	OBS	OBS	OBS	-	-
-	-	-	30	40	40	40	40	40	50	40	40	-
60	60	50	50	50	40	70	70	50	40	30	30	43
40	50	40	40	40	40	60	50	50	50	50	40	36
30	40	30	30	30	30	20	30	40	40	40	40	-
40	40	40	50	50	40	10	20	10	-10	-10	-10	30
-40	-30	-30	-20	-10	-20	-30	-40	-30	-20	0	10	-40
60	70	70	80	70	40	80	70	40	30	10	20	34
40	40	50	50	50	60	60	50	50	40	40	30	39

Date	00	01	02	03	04	05	06	07	08	09	10	11
031101	30	20	(20)	–	–	–10	10	10	20	10	0	10
031102	0	–10	0	0	0	–30	–20	[–S]	–S	10	40	40
031103	10	20	10	20	30	70	–	–	–	50	40	40
031104	10	30	10	10	10	10	30	[30]	40	40	40	30
031105	10	10	10	10	10	20	[20]	40	50	50	60	70
031106	30	20	20	20	10	10	–10	[10]	40	40	40	40
031107	60	60	40	30	30	30	OBS	20	0	10	–90	0
031108	40	30	40	30	40	40	60	70	[50]	40	40	30
031109	10	20	20	30	10	30	40	[40]	30	10	10	20
031110	20	40	80	80	70	60	–	[20]	40	60	50	40
031111	30	30	40	40	40	70	50	50	[50]	–	–	70
031112	40	50	40	40	40	40	30	[50]	40	30	30	40
031113	20	20	20	10	10	10	10	[10]	30	30	40	40
031114	40	40	40	30	20	30	30	[30]	20	–S	0	10
031115	40	40	40	30	30	40	30	[30]	10	0	10	30
031116	–10	–20	–20	–10	–40	–30	–60	–20	[20]	30	40	50
031117	30	30	30	50	50	30	–	[30]	–20	30	10	20
031118	30	40	30	30	40	30	40	[30]	–	40	40	40
031119	40	30	20	20	30	30	30	40	40	70	70	40
031120	80	60	40	40	40	30	30	[30]	[40]	60	60	40
031121	80	100	110	110	140	130	120	[130]	110	140	100	100
031122	0	–10	0	10	10	10	10	[20]	30	20	30	30
031123	130	100	100	90	90	90	90	90	[90]	60	40	30
031124	80	90	80	80	70	40	–	[70]	80	80	70	40
031125	30	30	20	30	40	[30]	30	40	40	40	40	70
031126	130	90	90	90	80	[80]	70	90	70	30	30	40
031127	10	10	10	10	–10	–10	–10	0	0	10	30	30
031128	30	30	30	40	40	[60]	40	60	70	60	60	70
031129	10	10	10	10	10	10	20	[10]	10	30	40	40
031130	30	10	30	30	20	20	30	30	[60]	40	20	30

12	13	14	15	16	17	18	19	20	21	22	23	mean
10	20	10	10	30	30	30	30	40	0	-10	-10	-
40	40	30	40	40	40	40	40	30	20	10	20	-
40	50	50	30	20	20	40	40	30	40	30	10	-
30	40	30	40	50	50	60	50	40	30	20	10	31
60	60	40	30	40	40	40	30	30	30	40	40	35
40	40	40	40	30	-10	OBS	-S	10	20	30	40	-
0	10	-10	30	30	40	40	40	30	50	50	40	23
40	40	40	40	40	40	50	40	30	40	40	20	40
10	30	30	40	40	30	40	40	40	40	40	30	28
40	50	40	40	40	30	10	30	40	40	40	30	43
60	40	40	40	50	40	40	40	50	50	40	40	-
40	50	40	50	50	50	40	30	30	30	30	30	39
40	50	50	40	50	70	50	50	70	60	50	40	36
20	20	10	20	20	30	10	40	40	40	30	40	27
40	70	70	60	60	50	40	30	10	0	10	-10	32
70	80	80	90	80	30	20	30	20	-10	-50	-10	15
20	30	40	50	40	40	50	40	50	40	40	30	33
40	40	40	30	30	30	30	40	40	30	30	60	36
40	[40]	80	60	80	90	100	110	120	100	90	80	60
40	40	40	40	40	40	40	60	40	40	40	40	44
90	90	90	90	60	90	40	80	30	30	30	10	88
40	40	30	60	40	30	70	130	90	60	100	130	41
40	40	40	30	40	70	80	90	90	90	90	60	73
40	60	90	80	90	110	60	30	20	0	10	30	61
90	60	40	40	60	90	140	90	120	110	140	100	63
40	30	40	30	30	40	40	30	0	10	20	10	50
30	30	30	30	30	30	30	30	30	10	10	10	16
40	60	40	30	30	40	30	10	OBS	40	20	10	41
40	40	40	40	40	70	90	70	90	80	40	40	37
20	10	20	20	0	0	0	10	-20	-10	-10	-10	16

Date	00	01	02	03	04	05	06	07	08	09	10	11
031201	-10	-10	-20	-30	-40	-	-10	[-20]	[-20]	-10	-10	-10
031202	-10	0	0	10	30	20	-10	[-10]	-20	-30	-30	-20
031203	-20	-10	-10	-20	-30	-20	0	-10	-10	-10	0	-30
031204	-30	-20	-20	-20	-20	-20	[-10]	-10	0	-40	-30	-20
031205	30	30	30	20	10	10	20	[30]	20	10	20	20
031206	30	70	60	30	30	30	20	[30]	10	20	10	10
031207	20	30	40	40	40	40	40	40	[40]	40	40	40
031208	40	40	40	30	30	40	-	-	70	70	40	50
031209	40	40	40	30	30	40	40	[40]	40	40	50	60
031210	40	30	20	40	40	30	30	[30]	30	40	30	40
031211	10	10	-10	-30	-20	-30	-20	-10	-10	0	0	-10
031212	40	60	60	70	80	50	80	[80]	50	50	80	80
031213	30	20	30	20	10	20	20	[40]	40	50	40	40
031214	-10	-30	-10	-10	20	30	0	10	-	0	10	OBS
031215	30	30	30	20	20	10	OBS	OBS	-	30	40	40
031216	-20	-10	10	20	20	30	20	-10	10	30	40	30
031217	30	30	30	40	40	30	40	[40]	70	60	40	30
031218	40	40	40	40	40	40	30	[40]	60	50	40	40
031219	30	30	50	20	30	40	30	[40]	[40]	60	50	60
031220	90	80	70	80	70	40	40	[70]	40	50	50	20
031221	20	-30	-60	-30	10	30	70	[60]	70	80	70	40
031222	20	10	20	20	30	40	-	-	-	60	60	60
031223	20	30	30	30	30	30	30	[30]	30	30	30	40
031224	40	40	40	40	30	30	30	[40]	40	40	40	50
031225	30	40	40	40	40	40	[30]	40	40	40	50	40
031226	40	40	40	40	50	30	40	40	[40]	50	70	80
031227	40	40	40	30	30	20	20	[20]	[0]	-20	-10	10
031228	80	40	30	30	20	30	-10	-	-50	-50	20	0
031229	10	20	20	10	10	0	-10	[10]	20	30	-70	0
031230	50	30	0	-10	10	0	40	[40]	50	40	30	30
031231	-10	30	10	10	10	10	0	10	-10	-70	-20	-10

12	13	14	15	16	17	18	19	20	21	22	23	mean
-10	-10	0	-10	0	10	20	0	10	-10	0	0	-8
-10	-10	-30	-40	-30	-20	-30	-30	-20	-30	-30	-30	-16
-20	-20	-30	-30	-30	-30	-10	0	-10	-20	-30	-30	-18
-20	-30	-30	-20	20	30	10	20	20	30	30	30	-6
30	30	40	30	40	40	60	40	40	40	30	20	29
-10	OBS	-10	10	40	40	40	40	30	30	30	20	27
40	40	40	40	40	40	30	40	80	70	70	40	43
50	50	50	70	60	80	60	70	70	70	70	50	-
60	60	70	70	80	80	90	80	40	40	40	60	53
40	40	40	40	10	30	30	20	20	20	30	10	30
[0]	0	-10	-20	-20	-20	0	-10	-30	-50	0	30	-10
90	40	40	50	40	40	40	30	40	40	30	30	54
40	40	40	40	40	0	30	10	30	30	20	0	28
50	-10	30	40	40	40	40	40	40	40	40	30	-
30	OBS	40	40	OBS	OBS	OBS	OBS	OBS	OBS	OBS	20	-
20	10	10	-S	OBS	40	60	40	20	20	30	30	-
10	0	0	10	40	50	40	30	30	30	30	30	33
60	70	60	60	50	60	60	60	50	30	50	30	48
60	60	60	40	80	80	50	70	100	100	90	90	57
70	60	70	50	60	80	80	80	30	70	60	30	60
40	60	60	-10	20	10	20	40	30	30	10	30	28
50	50	60	60	60	60	40	50	50	40	40	40	-
30	30	40	40	40	40	40	40	40	40	40	40	34
60	60	60	60	60	50	50	60	50	40	40	40	45
40	40	40	50	60	70	100	80	70	70	60	40	50
80	70	70	60	70	60	60	60	50	70	60	50	55
10	30	50	50	50	70	80	80	70	50	50	40	35
10	20	20	20	20	30	20	10	20	10	10	10	15
30	0	-30	-40	30	40	40	10	40	40	40	40	12
70	80	70	60	80	90	110	120	10	30	40	30	46
-30	-70	-70	20	-10	-20	-20	-50	-40	-60	-50	0	-18

*Hourly means of the
2004*

Date	00	01	02	03	04	05	06	07	08	09	10	11
040101	10	30	40	40	40	10	10	[10]	10	30	20	30
040102	40	30	30	30	30	30	30	–	–	30	30	30
040103	10	20	20	20	30	20	20	[10]	[20]	40	40	40
040104	30	20	20	10	30	20	30	[40]	40	40	40	40
040105	70	80	80	80	+S	OBS	–S	–	–	OBS	–50	120
040106	40	50	50	40	50	50	60	80	[40]	70	70	70
040107	30	40	30	0	–10	–50	–20	[–10]	–20	0	20	50
040108	70	60	50	40	40	50	60	40	[70]	80	80	80
040109	–50	–50	–60	–60	–50	–40	–30	–40	[–30]	–60	–50	–40
040110	70	70	80	150	110	80	90	[150]	40	40	30	40
040111	40	40	40	40	50	30	30	[30]	40	40	80	80
040112	20	40	90	–	–	–	–	–	30	40	30	70
040113	–10	–20	–10	10	20	30	40	[30]	–	40	40	50
040114	–S	OBS	–S	10	30	30	40	[40]	30	40	40	40
040115	40	30	–S	OBS	OBS	–S	OBS	[20]	50	40	40	30
040116	30	30	30	30	40	40	50	[60]	50	50	60	60
040117	60	70	50	50	40	40	[40]	50	70	80	80	70
040118	60	40	50	40	40	40	40	40	[40]	50	40	40
040119	30	40	30	20	30	30	–	–	–	50	40	40
040120	–50	–30	–30	–30	–20	–110	–30	–10	–10	–10	10	10
040121	30	30	40	30	40	50	50	[50]	50	40	40	30
040122	40	40	30	30	40	30	OBS	OBS	–S	–S	30	40
040123	80	50	50	70	60	50	70	[80]	[80]	80	80	70
040124	80	70	70	60	80	70	70	[70]	[80]	70	70	60
040125	70	60	40	40	40	50	60	[70]	[80]	80	80	80
040126	40	30	40	40	30	10	–	30	20	30	40	60
040127	10	40	40	40	40	40	20	[–10]	–	10	0	30
040128	70	80	130	80	90	50	40	40	[30]	40	30	40
040129	20	20	20	20	30	40	40	40	80	[80]	90	70
040130	30	30	30	30	30	40	40	60	[50]	70	80	90
040131	60	40	60	80	70	80	90	[90]	[90]	80	90	80

potential gradient

12	13	14	15	16	17	18	19	20	21	22	23	mean
40	40	50	60	60	60	60	60	50	50	40	40	37
30	30	30	40	40	40	40	40	30	30	30	20	—
50	50	60	70	70	50	50	50	50	40	30	30	37
40	40	50	30	20	30	80	50	30	30	30	−10	33
−30	80	30	20	70	70	50	40	−10	10	10	10	—
80	80	90	90	80	80	70	80	50	30	40	30	61
80	90	70	60	70	30	50	50	110	80	60	50	36
90	120	80	30	30	50	20	−40	−60	−40	−50	−30	38
0	−30	−60	10	20	30	40	20	30	30	30	60	−16
70	60	60	40	40	40	40	40	40	60	40	40	63
80	50	40	40	30	30	20	30	20	−S	−S	−S	—
60	50	30	40	50	50	40	40	−40	−20	−10	0	—
50	40	−20	30	40	40	30	30	0	40	60	70	27
40	40	40	60	70	80	100	90	50	50	40	40	—
30	30	30	30	30	20	20	30	10	30	30	30	—
70	90	80	80	70	60	60	60	50	60	50	50	55
20	30	80	80	50	40	50	60	50	50	60	60	55
40	50	30	30	30	40	40	50	40	40	30	30	40
40	50	50	40	40	30	40	30	20	20	−20	−S	—
0	30	40	10	30	40	40	40	50	50	40	40	4
30	40	30	OBS	40	50	40	−S	20	50	40	40	—
40	40	50	50	50	70	80	80	90	80	80	80	—
70	80	80	90	80	70	70	60	80	100	80	80	73
60	60	70	70	40	40	50	60	80	60	60	70	65
70	60	40	40	40	70	40	50	30	140	130	30	62
70	60	40	30	40	40	20	10	0	10	20	0	31
40	30	0	50	40	170	130	130	110	80	70	80	52
40	40	50	60	50	70	60	80	80	50	30	30	57
80	70	70	70	120	80	80	60	30	40	40	40	55
90	80	70	50	70	80	80	80	90	80	60	50	61
90	90	110	90	90	100	110	90	110	100	90	80	86

Date	00	01	02	03	04	05	06	07	08	09	10	11
040201	70	60	60	80	80	80	70	[70]	80	80	70	100
040202	40	30	30	30	40	40	–	–	[40]	40	50	70
040203	–	–	–	–	60	40	80	80	80	80	60	40
040204	10	20	30	10	10	20	30	30	[40]	40	30	40
040205	30	30	30	30	20	30	40	[30]	[40]	40	50	70
040206	30	20	20	30	20	20	30	30	[30]	40	50	40
040207	60	40	30	20	10	20	20	[40]	[30]	40	40	40
040208	30	30	30	20	30	30	30	[–10]	20	20	30	30
040209	10	10	10	30	10	10	–	–	[30]	30	30	30
040210	OBS	OBS	60	30	30	20	30	[40]	[30]	40	40	30
040211	40	40	30	20	20	20	20	[10]	–10	–10	20	30
040212	30	30	30	50	40	50	70	10	[40]	40	50	20
040213	60	40	40	40	40	110	+S	[20]	–	40	70	70
040214	30	30	30	20	20	10	10	10	10	10	30	50
040215	30	30	30	10	10	10	10	20	[40]	40	40	40
040216	30	20	+S	+S	10	10	20	–	–	40	40	40
040217	30	30	30	40	40	40	40	[60]	[50]	50	60	50
040218	70	50	40	30	30	30	30	40	[40]	70	40	40
040219	30	30	30	20	20	30	40	[70]	–	60	50	50
040220	40	40	40	30	30	30	30	[40]	[60]	50	50	50
040221	40	40	40	30	40	40	50	[50]	50	50	40	60
040222	10	10	20	10	–10	0	0	[–10]	–10	–10	–10	10
040223	–20	20	70	130	130	120	–	–	–30	–30	10	OBS
040224	40	40	30	30	30	30	40	40	[50]	50	40	40
040225	30	30	30	30	30	40	50	[60]	60	70	60	60
040226	80	60	70	40	50	50	80	[40]	40	50	100	120
040227	OBS	OBS	+S	40	10	20	0	10	[20]	40	40	30
040228	20	30	40	30	30	40	40	[40]	[40]	40	40	50
040229	–S	–S	–S	–20	10	10	0	–10	30	40	30	30

Date	00	01	02	03	04	05	06	07	08	09	10	11
040301	30	30	30	30	30	30	–	–	–	30	40	30
040302	40	30	30	30	30	30	40	[60]	[30]	20	30	10
040303	10	10	10	10	10	20	30	[40]	40	40	40	40
040304	30	20	20	20	30	40	50	[40]	40	40	40	50
040305	40	40	40	30	30	40	40	[40]	[30]	30	20	30
040306	40	40	40	30	20	30	30	20	[10]	30	50	50
040307	20	20	0	–10	20	20	20	[20]	[30]	30	30	30
040308	OBS	OBS	OBS	OBS	OBS	–S	–	–	–	30	20	10
040309	–40	–50	–10	–30	–50	0	0	10	[–10]	–20	30	10
040310	20	10	10	10	10	20	20	30	–	40	40	40
040311	40	40	30	30	30	30	30	40	[40]	40	40	40
040312	20	30	30	30	30	20	30	[40]	[40]	40	40	40
040313	–10	0	–10	–10	–20	–30	0	[20]	10	20	30	30
040314	30	40	40	40	40	30	40	[40]	40	60	60	50
040315	40	40	30	40	50	70	90	[80]	–	50	60	60
040316	40	30	30	20	20	30	30	–	–	30	30	30
040317	30	20	30	30	30	30	40	40	[30]	40	40	40
040318	30	30	30	30	40	40	50	[50]	50	50	50	40
040319	30	30	30	30	20	10	20	[30]	[30]	20	30	30
040320	20	20	20	20	10	10	20	[0]	20	30	30	40
040321	0	40	40	20	20	20	20	[20]	20	10	30	30
040322	OBS	–S	10	–50	0	–30	–	–	–	20	30	30
040323	30	20	20	20	30	[20]	0	–30	–20	0	–70	–60
040324	–10	–10	10	20	20	20	20	10	[30]	20	70	10
040325	80	80	50	30	10	10	0	–30	–30	10	–10	–40
040326	30	20	10	10	10	0	–30	[20]	[40]	40	40	40
040327	–20	–40	–30	–10	–10	[30]	60	70	40	30	–10	50
040328	20	20	30	30	30	30	[40]	30	30	30	30	40
040329	40	40	30	40	40	–	[40]	–	50	40	50	50
040330	50	30	30	40	30	30	[30]	40	40	40	30	30
040331	30	30	20	30	30	30	30	[20]	30	40	30	30

12	13	14	15	16	17	18	19	20	21	22	23	mean
40	40	40	40	40	40	40	40	40	40	30	30	-
30	30	40	40	40	30	40	40	30	30	30	10	32
40	40	40	40	50	40	40	30	40	60	OBS	OBS	-
40	50	60	50	60	60	50	50	60	50	40	40	43
40	40	60	60	60	50	40	50	40	40	40	40	40
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30	20	30	40	60	60	70	30	30	40	70	100	34
20	40	60	0	-10	10	0	-10	-20	-20	-20	30	-
-10	-20	10	0	30	-20	10	-20	-10	0	10	10	-7
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40	40	40	40	40	40	40	30	40	40	50	40	40
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40	30	30	30	30	40	40	40	30	10	-10	-30	22
40	30	30	30	10	-10	0	0	-20	-20	-30	OBS	14
30	30	40	40	40	40	40	40	30	40	40	30	-
-70	-30	-10	-10	-30	-20	-10	-20	-10	-10	-10	-40	-13
0	-20	0	0	-20	-S	+S	0	40	60	80	80	-
0	0	10	10	10	10	10	10	20	10	20	30	13
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60	70	80	60	60	40	50	50	60	40	40	50	-
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30	30	40	30	30	20	30	30	30	20	30	30	29

Date	00	01	02	03	04	05	06	07	08	09	10	11
040401	30	30	30	40	50	30	[30]	[40]	30	40	40	30
040402	10	10	10	10	20	20	30	[20]	30	30	30	30
040403	20	10	10	10	10	10	[10]	20	30	40	30	40
040404	20	10	0	10	20	OBS	OBS	[20]	30	30	30	30
040405	-	-	-	-	-	-	[20]	-	20	20	OBS	-S
040406	30	30	30	30	30	20	[30]	40	40	30	30	40
040407	40	50	40	30	30	40	[40]	[50]	30	20	20	20
040408	20	20	30	20	10	20	30	[40]	30	30	30	30
040409	30	40	20	30	30	20	[40]	40	40	40	40	50
040410	30	30	10	10	10	10	[20]	20	30	40	40	40
040411	30	30	0	-10	20	[30]	20	40	60	60	60	30
040412	40	30	30	30	30	30	[40]	40	40	50	60	60
040413	20	20	20	70	20	30	-	-	40	40	40	40
040414	10	10	10	10	10	10	20	[20]	30	30	40	40
040415	30	30	20	20	20	30	[30]	[30]	30	20	20	20
040416	10	0	-10	0	10	0	[20]	[30]	30	30	30	40
040417	30	20	30	10	-10	10	10	10	10	10	20	40
040418	10	0	20	40	40	40	30	30	[30]	30	40	40
040419	50	80	30	10	10	-	-	-	40	40	30	30
040420	OBS	0	30	-50	-10	-10	-	-	10	30	20	40
040421	30	20	10	10	20	[30]	40	40	40	40	40	40
040422	30	20	10	30	20	[20]	40	40	40	40	40	40
040423	20	10	20	10	20	30	[40]	[30]	30	40	40	40
040424	30	20	30	20	30	0	[20]	20	30	30	20	20
040425	40	40	40	30	30	30	[30]	30	30	30	30	20
040426	20	20	30	20	20	-	-	-	40	50	60	50
040427	30	30	30	30	20	30	[30]	[30]	30	30	30	40
040428	20	20	20	20	20	30	[30]	[30]	30	30	30	30
040429	10	20	20	20	30	30	[20]	20	20	30	30	30
040430	20	10	20	10	20	20	[20]	30	30	30	30	40

12	13	14	15	16	17	18	19	20	21	22	23	mean
30	30	30	40	30	30	40	40	30	40	40	30	35
30	30	30	30	20	20	30	30	30	30	20	20	24
40	40	40	30	30	30	40	40	30	30	30	30	27
20	-S	OBS	+S	OBS	30	40	70	80	-	-	-	-
40	40	40	30	30	40	40	40	40	40	40	40	-
30	40	30	20	-S	OBS	-S	OBS	-10	20	40	50	-
30	20	30	20	30	40	40	50	40	40	30	20	33
20	20	OBS	-60	0	20	-40	40	30	30	30	30	19
40	40	40	40	30	30	40	30	30	30	30	30	35
40	30	-10	-10	30	10	30	30	30	40	30	40	24
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60	60	50	40	40	50	40	50	50	40	30	30	43
40	0	-30	30	10	0	-20	-10	20	20	30	20	-
30	40	30	30	30	30	20	20	30	20	20	30	24
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30	30	30	20	10	20	30	30	30	30	-20	10	18
40	40	40	30	30	10	40	40	40	30	30	10	24
40	40	40	40	40	40	30	OBS	OBS	30	30	20	-
30	OBS	OBS	+S	+S	OBS	OBS	OBS	OBS	OBS	OBS	OBS	-
80	70	50	40	30	30	20	20	20	10	10	10	-
40	50	50	50	50	40	40	40	30	30	30	20	35
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30	30	30	30	30	30	20	20	10	10	10	10	24
40	40	40	40	30	30	30	40	40	40	30	20	29
40	40	30	30	30	50	40	50	40	40	30	40	31

Date	00	01	02	03	04	05	06	07	08	09	10	11
040501	30	20	20	20	30	30	[40]	40	40	40	40	40
040502	30	30	30	30	30	30	40	[30]	30	10	10	20
040503	20	0	10	10	10	-	-	-	30	20	20	30
040504	10	20	20	10	0	10	[20]	30	20	20	30	0
040505	10	0	10	10	10	10	[10]	[20]	10	0	10	0
040506	10	20	10	30	10	10	20	10	30	OBS	-S	OBS
040507	10	10	10	10	20	30	[30]	30	20	10	20	20
040508	30	30	30	20	30	[30]	30	30	-20	20	60	20
040509	20	10	10	10	20	40	70	40	30	0	10	10
040510	30	30	20	20	30	-	-	-	30	20	20	20
040511	10	10	10	10	10	20	[20]	20	20	20	10	10
040512	10	10	10	10	10	10	[20]	20	30	30	30	40
040513	20	20	20	20	30	30	[50]	30	20	20	10	OBS
040514	40	30	30	30	30	30	[30]	20	30	30	20	30
040515	10	10	10	10	10	[30]	40	40	40	40	40	40
040516	-S	OBS	OBS	OBS	-S	-20	[140]	70	30	30	10	10
040517	30	30	30	20	20	-	-	-	10	20	20	30
040518	30	30	20	10	10	30	[30]	[20]	20	30	30	30
040519	0	0	0	0	0	0	[10]	30	40	30	40	40
040520	20	10	10	10	10	30	[30]	30	30	40	40	40
040521	20	30	20	10	40	70	40	[40]	40	40	40	40
040522	-20	0	20	30	10	OBS	OBS	-10	80	80	80	50
040523	0	0	10	10	20	30	40	[30]	30	10	10	10
040524	20	30	20	10	20	-	-	50	40	30	30	30
040525	10	10	10	10	10	10	10	[20]	20	30	30	40
040526	20	20	10	10	10	30	20	[30]	30	30	30	30
040527	20	30	20	20	30	50	80	[70]	-10	10	50	80
040528	30	30	20	20	30	OBS	[-30]	[-20]	-30	30	OBS	OBS
040529	30	30	30	30	40	50	[80]	[80]	50	40	40	30
040530	30	30	30	30	40	40	[40]	50	40	50	50	50
040531	30	30	30	30	30	30	-	[50]	50	60	60	50

12	13	14	15	16	17	18	19	20	21	22	23	mean
40	30	20	40	40	40	40	40	40	40	30	30	34
30	30	20	20	-S	OBS	OBS	0	OBS	OBS	-S	30	-
30	30	20	20	30	30	30	30	40	40	30	20	-
0	10	10	10	10	0	OBS	10	10	10	0	10	12
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OBS	0	30	40	30	20	30	30	20	10	10	10	-
30	-10	0	30	40	40	40	40	40	30	30	30	23
30	0	OBS	OBS	OBS	60	20	20	10	30	20	20	-
20	20	20	-S	OBS	OBS	10	10	30	30	30	30	-
30	30	20	20	20	20	30	30	20	20	20	10	-
20	30	30	30	30	30	30	30	30	20	10	10	19
40	40	30	40	40	40	40	30	OBS	OBS	20	30	-
30	20	10	0	-30	20	OBS	10	40	40	40	40	22
30	40	30	30	30	30	30	30	30	30	20	10	29
30	20	30	20	20	-S	-S	-20	30	0	-50	-S	-
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30	30	30	30	30	30	-S	-S	20	-10	10	10	-
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-S	OBS	OBS	OBS	OBS	OBS	70	20	20	20	10	-20	-
-10	20	10	0	0	10	0	10	10	10	-10	-10	-
20	30	20	-S	OBS	OBS	30	-S	30	20	OBS	20	-
30	30	30	30	30	30	20	10	20	20	10	10	-
40	40	40	40	40	40	40	30	30	20	20	20	25
30	20	20	30	30	10	10	OBS	OBS	20	OBS	OBS	-
50	50	-S	OBS	-S	30	-10	-40	-40	40	40	30	-
-S	OBS	-S	-S	30	60	70	50	40	40	40	30	-
30	0	20	20	30	30	20	30	30	20	30	30	34
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Date	00	01	02	03	04	05	06	07	08	09	10	11
040601	10	20	20	20	20	30	—	—	20	20	10	20
040602	20	10	10	0	OBS	+S	OBS	—S	OBS	OBS	OBS	30
040603	30	40	40	30	20	—S	—S	[—S]	—S	—S	—10	30
040604	0	30	10	—20	10	30	[40]	[40]	0	0	30	40
040605	30	30	20	10	10	[10]	[20]	30	50	60	50	30
040606	30	30	30	10	30	40	30	[40]	[40]	20	30	30
040607	20	20	20	20	10	—	—	—	40	40	40	40
040608	10	10	0	10	10	20	[20]	30	30	40	50	50
040609	10	10	10	10	10	30	[30]	[30]	30	50	50	60
040610	20	30	20	20	10	20	[30]	40	40	OBS	OBS	30
040611	30	30	20	OBS	—S	30	[80]	[40]	30	30	30	40
040612	OBS	OBS	10	10	30	40	[80]	60	60	40	30	0
040613	10	10	30	70	50	50	50	[40]	40	50	50	40
040614	30	30	30	20	20	—	—	—	30	40	50	40
040615	10	10	10	10	10	10	[30]	30	40	30	30	40
040616	10	80	10	10	10	10	10	10	10	10	40	40
040617	20	20	20	20	20	40	[40]	[30]	30	30	20	30
040618	10	10	10	10	10	20	[30]	—S	OBS	OBS	20	0
040619	30	30	40	20	30	20	[30]	[40]	30	30	40	30
040620	OBS	OBS	60	20	40	30	[40]	OBS	80	20	50	40
040621	20	10	10	10	10	—	—	—	50	40	30	30
040622	10	10	10	10	30	40	40	[40]	40	40	40	40
040623	40	30	30	20	20	40	[30]	[30]	30	40	40	40
040624	20	20	30	10	20	30	[30]	40	30	30	30	40
040625	10	30	—S	—S	OBS	OBS	OBS	OBS	—S	OBS	OBS	OBS
040626	10	20	10	10	20	30	[70]	80	90	60	40	30
040627	20	20	20	10	10	30	[30]	30	30	30	40	40
040628	10	10	10	10	10	—	—	—	30	30	30	30
040629	20	10	10	10	10	30	[30]	30	30	40	40	40
040630	10	10	0	10	10	30	[60]	40	50	40	40	40

12	13	14	15	16	17	18	19	20	21	22	23	mean
30	40	40	40	40	30	30	20	30	20	10	10	—
40	40	90	70	40	30	30	30	30	40	40	40	—
40	30	10	30	10	−40	−30	30	40	0	−40	−20	—
140	+S	80	40	40	30	30	30	30	30	20	20	30
20	30	30	30	20	10	30	30	40	40	30	10	28
30	20	20	30	30	30	20	20	30	30	20	20	28
40	40	50	40	40	40	40	40	30	20	10	10	—
60	60	60	70	40	40	30	20	20	30	20	20	31
60	60	60	50	40	−S	OBS	OBS	OBS	−S	30	30	—
50	40	40	40	40	30	30	30	20	20	20	30	—
40	40	30	−S	OBS	−S	10	0	10	10	10	−10	—
OBS	+S	OBS	OBS	OBS	OBS	OBS	10	10	10	−10	0	—
30	30	30	20	10	10	10	20	20	20	30	30	31
40	40	40	50	40	40	40	40	20	20	20	10	—
40	40	40	40	40	40	30	20	20	30	10	10	26
40	40	30	30	30	30	30	30	30	20	20	20	25
30	30	30	30	30	20	10	10	10	10	10	10	23
20	OBS	OBS	OBS	OBS	−S	30	50	80	40	80	40	—
20	20	10	20	20	0	20	−S	OBS	OBS	OBS	OBS	—
10	+S	OBS	OBS	OBS	30	40	20	20	10	10	10	—
OBS	OBS	20	30	30	30	20	20	20	10	10	20	—
40	40	30	40	+S	OBS	+S	20	30	20	30	30	—
40	50	50	50	40	50	50	40	40	20	30	30	37
40	40	40	50	40	40	30	OBS	−40	−60	10	10	23
OBS	OBS	OBS	30	30	30	40	40	30	20	20	20	—
30	30	30	40	30	20	20	20	20	10	10	10	31
40	40	40	40	40	70	40	30	20	10	10	10	29
30	40	30	30	30	30	30	30	30	20	20	20	—
30	30	OBS	30	OBS	10	+S	OBS	60	20	10	10	—
40	40	40	40	40	30	30	30	30	30	30	20	31

Date	00	01	02	03	04	05	06	07	08	09	10	11
040701	20	30	40	20	30	30	[30]	40	40	40	40	40
040702	10	10	10	0	0	10	20	[-10]	10	-10	-10	-20
040703	20	30	20	20	30	[50]	80	80	70	50	40	50
040704	30	20	20	20	10	20	[20]	30	30	40	40	40
040705	40	40	40	40	50	-	-	50	40	40	+S	40
040706	10	20	20	(10)	20	30	[90]	70	60	40	40	40
040707	20	10	10	10	10	30	[40]	50	50	80	50	40
040708	20	30	40	40	40	40	[30]	40	40	50	50	50
040709	30	30	30	30	30	30	OBS	+S	30	30	30	OBS
040710	30	30	30	30	30	30	[30]	40	30	40	40	40
040711	30	30	20	20	20	30	40	30	[30]	30	30	30
040712	20	30	20	20	20	-	-	-	20	30	30	30
040713	20	30	30	30	40	40	[40]	40	40	40	40	40
040714	40	30	30	30	30	40	[40]	40	40	40	30	40
040715	10	20	0	-10	10	30	[80]	[50]	80	50	10	20
040716	30	10	10	10	10	20	[30]	40	40	40	40	50
040717	10	20	10	10	10	10	10	20	20	30	40	40
040718	30	30	40	30	40	40	40	[40]	40	50	50	50
040719	20	20	0	10	10	-	[40]	-	30	30	40	50
040720	20	10	10	10	10	30	[30]	30	30	30	40	30
040721	10	10	10	10	20	30	[30]	30	40	40	60	60
040722	20	20	20	20	20	30	[40]	30	40	30	20	OBS
040723	40	40	40	40	40	50	[50]	[50]	50	50	60	60
040724	20	20	30	20	30	40	[40]	[30]	30	40	40	50
040725	10	10	10	10	10	10	20	20	[30]	40	40	50
040726	30	30	30	30	20	-	[30]	-	40	40	40	40
040727	20	20	20	10	20	30	[30]	30	40	40	40	30
040728	30	30	30	20	20	30	[30]	30	30	40	40	30
040729	10	10	30	30	30	0	0	0	10	10	10	0
040730	30	30	30	30	30	30	[40]	40	40	40	40	30
040731	40	30	30	30	30	40	[40]	40	40	40	60	50

12	13	14	15	16	17	18	19	20	21	22	23	mean
40	60	+S	OBS	OBS	OBS	-S	OBS	-S	20	OBS	0	-
0	10	20	10	-20	20	-20	-20	-10	-30	0	10	0
40	40	40	40	30	30	20	-S	10	30	30	30	38
40	40	40	40	40	50	40	40	40	40	40	30	33
OBS	OBS	OBS	OBS	OBS	0	10	OBS	OBS	10	10	10	-
+S	OBS	OBS	OBS	OBS	20	40	40	30	40	30	30	-
40	40	30	30	30	40	40	30	30	20	20	20	32
60	60	70	60	60	50	50	60	70	70	40	40	48
50	10	0	OBS	30	40	30	30	30	40	40	30	-
40	40	30	30	30	30	20	40	40	40	40	30	34
0	-10	-10	0	30	30	40	10	30	30	30	30	23
40	40	40	40	20	OBS	30	40	20	20	20	20	-
40	40	50	40	40	40	30	50	60	50	40	40	40
30	30	10	30	30	40	40	40	40	30	20	20	33
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[40]	[40]	40	40	40	30	30	30	20	30	30	30	26
40	40	+S	+S	20	30	30	20	20	20	10	10	-
+S	+S	OBS	-S	30	30	40	30	30	20	10	20	-
40	40	40	40	40	30	30	30	20	20	10	20	27
70	70	70	70	50	40	30	20	20	20	20	20	35
OBS	OBS	OBS	30	30	40	40	40	50	40	40	40	-
50	60	50	50	50	40	40	40	30	40	30	30	45
40	40	40	+S	20	20	30	30	30	20	10	10	30
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20	30	30	30	30	30	30	40	20	10	10	10	27
0	-10	0	10	20	20	30	30	30	30	30	30	15
40	40	40	40	40	30	30	30	20	30	30	40	34
50	60	60	50	60	50	40	40	40	40	20	20	42

Date	00	01	02	03	04	05	06	07	08	09	10	11
040801	20	30	20	10	10	20	-S	OBS	0	40	40	50
040802	20	20	20	20	20	-	-	[30]	30	40	40	40
040803	20	20	20	10	10	10	20	[30]	30	30	60	50
040804	20	20	30	20	20	30	[50]	50	50	40	40	50
040805	20	20	20	20	20	20	30	[30]	30	40	40	40
040806	10	20	20	20	20	30	[20]	30	30	30	30	40
040807	20	20	20	OBS	OBS	-S	[80]	150	80	50	40	40
040808	30	40	30	30	30	40	50	40	[40]	60	70	60
040809	40	40	30	30	20	-	-	30	40	50	60	60
040810	30	30	30	30	20	40	[50]	40	50	50	60	50
040811	20	20	10	20	30	30	[30]	30	40	40	40	30
040812	10	20	10	10	10	20	[40]	30	20	30	30	40
040813	20	10	-S	-S	20	30	[10]	30	80	30	30	30
040814	OBS	OBS	0	20	20	[30]	40	40	40	40	40	40
040815	10	10	20	20	30	30	40	40	40	40	40	40
040816	10	10	20	20	10	-	-	30	30	30	30	40
040817	30	30	20	20	20	20	[20]	[30]	30	30	40	40
040818	20	10	10	10	20	30	[20]	30	30	30	40	50
040819	10	10	20	20	10	20	30	[30]	30	30	30	40
040820	20	10	10	10	20	30	[40]	30	30	30	10	20
040821	+S	OBS	+S	20	20	20	[40]	40	40	40	30	30
040822	10	10	20	20	20	20	[30]	30	30	30	40	30
040823	30	30	30	30	30	-	-	-	40	40	40	40
040824	40	30	40	30	40	40	[40]	40	40	40	30	30
040825	+S	-70	OBS	30	+S	-S	[70]	+S	0	30	10	30
040826	OBS	20	10	10	10	+S	[30]	50	40	50	20	20
040827	40	30	30	20	20	30	[40]	30	30	40	50	40
040828	20	20	20	30	20	[20]	30	30	30	30	40	40
040829	20	10	20	20	30	40	[30]	10	30	20	30	30
040830	20	20	10	20	20	-	-	-	20	30	30	30
040831	10	10	10	0	0	0	[50]	0	0	20	10	0

12	13	14	15	16	17	18	19	20	21	22	23	mean
20	30	40	40	50	40	30	OBS	50	30	30	20	–
50	50	50	40	40	40	30	30	30	20	10	20	–
50	60	70	60	50	40	40	30	30	20	50	10	34
60	50	60	60	40	40	40	30	40	30	30	10	38
40	50	40	40	40	30	30	20	10	10	10	20	28
40	30	OBS	–S	–20	40	30	30	20	10	10	20	–
30	40	30	30	20	40	30	30	30	30	40	30	–
70	60	60	60	50	40	40	40	30	20	30	30	44
50	30	110	140	80	40	30	30	20	20	30	30	–
50	60	60	40	40	40	40	30	20	20	20	20	38
30	40	40	30	30	30	30	30	30	20	30	20	29
40	40	50	40	30	30	30	30	30	40	30	20	28
30	30	30	20	10	10	10	10	10	10	30	40	–
30	30	30	30	30	20	10	20	20	20	10	10	–
30	30	[30]	30	30	20	10	10	20	20	0	10	25
40	40	40	40	40	40	40	40	40	30	30	30	–
40	40	50	40	40	40	40	30	30	30	30	20	32
50	OBS	–S	50	40	30	30	30	20	20	30	20	–
50	60	70	50	40	30	10	20	10	10	20	20	28
10	0	0	30	+S	80	0	50	30	30	30	20	23
20	20	20	10	10	–S	OBS	–30	30	30	30	10	–
40	40	40	40	40	40	40	40	40	40	40	30	32
50	50	50	40	50	50	40	40	40	40	40	40	–
10	20	20	30	30	+S	50	20	30	20	30	20	31
40	40	40	40	30	10	20	20	–S	OBS	OBS	OBS	–
30	30	–20	–30	30	30	30	30	30	30	30	40	–
40	50	50	40	40	40	40	40	30	30	30	30	36
40	40	40	40	40	40	40	40	40	30	30	20	32
40	40	40	30	30	30	40	30	30	30	20	30	28
30	30	30	20	20	20	20	30	20	10	10	10	–
–10	10	20	10	–10	0	–10	–10	–10	0	10	10	5

Date	00	01	02	03	04	05	06	07	08	09	10	11
040901	10	10	10	10	10	20	[30]	40	40	40	30	30
040902	30	30	20	20	20	[30]	[40]	30	20	20	30	30
040903	20	30	30	20	30	30	[30]	30	30	30	40	40
040904	20	10	10	10	[10]	20	30	30	30	40	40	40
040905	20	20	20	10	10	20	[40]	40	40	30	40	40
040906	40	30	30	30	30	30	–	30	(40)	60	60	60
040907	20	30	20	20	20	20	[20]	30	30	30	40	50
040908	10	20	20	10	20	20	[20]	20	(10)	30	30	30
040909	30	40	30	30	30	30	[40]	40	50	50	40	50
040910	40	30	30	30	30	30	30	[20]	20	30	30	30
040911	20	30	20	20	30	[30]	30	20	10	30	30	30
040912	30	30	30	30	30	20	[30]	30	30	30	40	40
040913	30	30	30	30	30	–	–	[40]	40	40	40	40
040914	40	40	50	40	50	40	[60]	[40]	30	40	40	40
040915	40	40	40	30	30	30	[10]	20	30	30	50	70
040916	30	30	30	20	30	20	40	–	40	30	30	40
040917	40	30	30	30	[30]	30	40	40	50	40	40	50
040918	10	10	20	20	20	20	[20]	30	30	30	40	40
040919	20	20	20	20	20	30	[30]	[30]	30	30	30	30
040920	20	20	20	20	20	–	[30]	–	30	40	40	40
040921	30	30	30	30	30	30	[30]	[30]	30	40	40	30
040922	30	30	20	30	0	10	[20]	[20]	20	10	0	10
040923	–70	–160	–50	–20	10	30	[30]	40	30	30	20	30
040924	–30	20	–S	10	0	10	30	[40]	40	40	60	30
040925	20	20	20	20	30	30	30	40	40	40	40	40
040926	30	20	30	20	30	30	[20]	[10]	20	30	30	40
040927	40	40	30	30	30	30	–	–	40	40	40	40
040928	10	10	10	10	10	10	[10]	[20]	30	40	40	40
040929	10	10	10	10	10	10	[30]	40	40	30	30	40
040930	OBS	20	20	20	20	[20]	30	30	40	40	–20	–10

Date	00	01	02	03	04	05	06	07	08	09	10	11
041001	30	20	20	20	20	20	[20]	10	30	30	40	40
041002	20	30	30	30	30	20	[20]	40	40	30	40	40
041003	20	20	30	10	10	10	–	30	60	40	40	40
041004	20	20	10	20	20	30	–	–	30	40	40	40
041005	10	–10	–10	10	20	40	[40]	30	20	40	40	40
041006	30	30	30	30	[30]	30	20	20	20	–	–	–
041007	–	–	–	–	–	–	–	–	–	–	–	–
041008	–	–	–	–	–	–	–	–	–	–	–	–
041009	–	–	–	–	–	–	10	OBS	OBS	30	40	40
041010	OBS	–S	10	OBS	–10	0	OBS	OBS	OBS	30	80	30
041011	20	20	20	20	20	–	–	–	60	50	40	50
041012	30	30	30	20	30	30	[20]	[20]	20	30	40	40
041013	0	0	10	10	–30	10	[10]	[10]	–10	10	10	10
041014	–10	10	10	0	–10	[–10]	–10	–10	–20	–20	–10	0
041015	0	0	0	10	10	20	10	–30	0	0	10	20
041016	10	20	20	20	10	10	–10	–80	–110	–S	OBS	–70
041017	30	30	30	20	20	10	[10]	30	40	50	40	40
041018	20	30	40	30	40	–	–	–	40	40	40	40
041019	20	20	30	20	20	30	[30]	30	40	40	40	40
041020	30	30	40	40	40	40	[40]	40	50	40	60	50
041021	30	30	20	30	20	[10]	[20]	10	20	10	30	40
041022	20	0	–90	OBS	–S	+S	–S	[–10]	20	80	80	70
041023	100	140	140	170	160	130	[80]	50	20	0	10	10
041024	80	50	30	40	30	40	[30]	20	20	10	20	30
041025	80	90	80	80	30	–	[70]	50	30	30	30	30
041026	30	30	0	20	30	30	[50]	40	40	30	40	40
041027	10	10	10	10	30	30	[40]	30	20	20	20	30
041028	10	20	10	10	10	10	[30]	30	30	30	30	30
041029	30	40	40	30	30	40	30	[40]	30	30	40	40
041030	40	30	30	20	10	10	[20]	30	30	30	30	40
041031	30	30	30	30	20	–30	–30	[20]	40	40	30	40

12	13	14	15	16	17	18	19	20	21	22	23	mean
40	40	40	40	30	40	40	40	30	30	20	20	30
40	40	30	30	20	OBS	OBS	20	20	20	20	20	-
40	40	40	40	30	30	30	30	30	30	30	20	30
50	50	40	50	50	50	50	40	30	0	10	20	-
40	30	30	40	30	30	40	30	30	20	10	20	26
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
30	40	40	30	30	-S	40	40	30	20	10	0	-
10	10	10	10	0	-20	-60	-30	30	40	40	30	-
40	40	40	40	30	40	40	40	40	40	30	40	-
30	30	30	30	20	0	10	0	0	-10	-10	0	20
10	10	0	-10	-10	-10	-10	0	-10	10	10	10	2
0	10	-10	0	0	-10	0	0	-10	-10	-10	-10	-5
0	10	10	10	10	20	30	30	20	20	20	20	10
-30	-20	-S	OBS	10	30	30	40	40	50	40	30	-
40	40	30	30	30	30	30	30	20	30	20	20	29
40	50	40	40	40	40	60	40	40	30	30	20	-
30	30	40	40	40	40	50	40	30	40	40	30	34
60	40	40	40	30	30	20	20	20	30	30	30	37
40	40	40	40	60	70	70	80	50	60	60	50	39
30	30	20	10	10	20	30	10	40	80	70	100	-
10	20	20	20	30	20	30	30	20	70	70	60	59
40	40	30	30	30	70	80	100	130	130	110	90	53
30	30	20	20	20	30	30	30	80	80	80	70	49
30	50	30	30	30	50	50	80	50	30	30	20	36
40	40	30	30	10	10	10	20	10	10	10	10	20
40	40	40	40	40	50	50	50	40	40	40	30	31
40	40	40	40	40	40	30	30	30	30	40	40	36
40	40	50	50	40	40	40	50	40	40	40	30	34
40	50	80	10	10	10	10	10	10	20	10	20	22

Date	00	01	02	03	04	05	06	07	08	09	10	11
041101	10	10	10	20	10	20	10	[20]	-	30	30	30
041102	10	10	10	10	10	10	10	[30]	50	30	30	30
041103	40	30	20	20	30	10	30	40	[30]	20	30	20
041104	0	10	10	20	20	30	[10]	10	20	20	30	40
041105	30	30	40	40	40	40	40	[40]	50	70	60	40
041106	10	10	30	20	20	20	30	30	30	40	30	30
041107	10	10	10	20	20	20	20	-	-	40	20	30
041108	20	20	30	30	20	30	-	-	-	40	40	30
041109	-10	-20	-20	-10	OBS	OBS	-S	-S	-S	+S	-S	-S
041110	40	70	80	60	40	60	80	[80]	[70]	80	60	40
041111	30	30	20	10	20	10	10	[10]	30	30	40	30
041112	10	0	0	10	10	10	10	[30]	40	40	40	40
041113	30	10	20	-20	-30	20	20	[30]	10	10	0	20
041114	20	30	20	20	30	30	30	[40]	40	40	40	40
041115	20	20	20	10	20	20	-	-	-	30	40	40
041116	40	40	40	40	40	30	30	[20]	20	30	20	20
041117	30	20	10	10	40	40	60	[50]	70	50	50	60
041118	40	50	40	40	40	40	40	[50]	60	60	50	40
041119	30	30	40	40	30	30	30	20	[20]	30	OBS	-S
041120	20	-S	OBS	OBS	OBS	40	30	[40]	[40]	40	40	40
041121	30	40	40	40	OBS	-S	30	[40]	40	40	40	40
041122	30	30	20	20	10	20	-	-	-	50	-20	-70
041123	20	10	20	10	10	30	30	[30]	30	30	30	30
041124	40	40	40	40	40	40	30	40	[40]	40	40	40
041125	40	40	40	40	40	40	40	[60]	80	70	60	40
041126	70	70	50	40	40	40	40	[50]	50	70	70	70
041127	40	50	40	30	30	30	20	[10]	40	40	30	30
041128	30	30	30	20	20	30	30	[30]	30	40	40	40
041129	80	80	60	80	70	60	-	-	-	80	80	70
041130	130	80	80	90	90	90	80	[50]	50	20	10	10

12	13	14	15	16	17	18	19	20	21	22	23	mean
10	20	20	10	10	10	10	10	10	10	10	10	15
30	40	30	30	30	30	40	110	150	80	40	30	37
40	40	30	20	10	30	10	10	10	10	0	10	23
40	40	50	40	50	40	30	30	30	30	10	10	26
30	30	30	20	10	20	10	10	0	20	20	10	30
40	40	[40]	40	60	40	30	40	40	40	10	10	30
40	40	40	40	30	30	20	20	30	30	20	20	—
30	40	40	40	40	40	30	10	10	10	OBS	-20	—
10	0	20	30	30	40	50	60	80	80	70	80	—
40	40	30	40	40	50	50	40	30	30	30	30	50
30	40	30	[30]	20	10	20	20	20	20	10	10	22
40	30	30	20	10	0	0	-10	20	20	30	40	20
30	30	10	30	30	30	30	30	30	20	20	20	18
40	40	50	60	50	50	40	40	40	30	20	30	36
40	40	40	50	60	70	70	60	70	50	50	40	—
30	30	30	30	40	40	40	40	40	20	40	20	32
40	50	50	80	90	20	80	80	80	80	70	60	53
50	50	50	60	80	70	50	50	40	40	30	40	48
30	30	OBS	OBS	OBS	-S	30	30	30	40	30	40	—
40	40	40	40	40	40	40	40	30	40	30	30	—
40	50	50	40	40	50	60	40	50	40	40	30	—
30	30	40	50	50	80	70	80	30	30	30	20	—
40	40	OBS	OBS	OBS	OBS	50	50	40	40	40	40	—
40	40	50	60	50	50	60	80	80	60	50	50	48
40	50	40	40	70	130	110	80	110	100	90	70	63
60	60	70	80	90	80	80	80	80	50	40	40	61
80	80	90	80	0	20	40	30	40	40	30	30	40
40	40	40	20	30	30	0	0	10	60	60	40	31
110	120	100	70	80	90	110	120	130	80	80	80	—
20	10	30	60	30	10	40	30	30	20	30	10	46

Date	00	01	02	03	04	05	06	07	08	09	10	11
041201	-20	20	-10	10	10	-10	[0]	10	0	0	0	0
041202	0	20	10	30	30	40	30	[40]	30	40	40	40
041203	20	30	20	20	10	20	30	[30]	40	60	60	50
041204	30	30	30	30	30	30	30	[20]	30	40	40	40
041205	30	30	20	30	30	20	30	[30]	30	10	10	10
041206	30	30	30	-	-	-	-	-	-	90	60	40
041207	40	40	30	30	30	40	40	[60]	40	40	40	40
041208	80	40	30	10	30	30	20	[30]	[40]	40	70	60
041209	40	30	30	40	40	30	40	[40]	[60]	40	40	40
041210	40	40	30	30	30	30	30	[30]	30	30	30	30
041211	30	30	40	30	20	20	30	[30]	20	20	20	30
041212	-20	0	0	10	10	10	10	30	[30]	10	10	30
041213	30	40	40	40	40	30	-	-	-	40	40	40
041214	10	10	10	10	30	40	20	[20]	30	20	20	30
041215	20	0	10	10	30	10	30	[0]	-10	0	0	30
041216	30	0	0	10	30	0	10	[-10]	-10	-20	-20	-10
041217	-40	-30	-30	-20	-40	-20	0	0	-S	OBS	-10	-20
041218	20	0	0	10	30	30	0	70	80	70	30	20
041219	30	40	40	40	40	40	40	40	-	40	60	60
041220	30	30	20	20	30	30	40	60	-	50	50	60
041221	60	50	50	50	40	[40]	40	60	40	50	60	70
041222	30	40	70	80	80	[30]	30	70	70	70	50	70
041223	40	70	70	40	-10	[0]	30	70	60	40	50	40
041224	30	20	30	20	20	20	20	30	30	[50]	70	70
041225	80	70	60	40	20	-10	0	40	[40]	50	50	60
041226	20	10	10	10	10	30	30	[20]	20	40	60	40
041227	-S	OBS	+S	OBS	OBS	OBS	OBS	OBS	-	10	20	30
041228	40	60	50	50	40	60	50	[40]	70	40	30	20
041229	40	50	60	50	40	30	40	-	-	40	40	40
041230	40	50	50	50	50	50	40	[40]	30	20	30	40
041231	40	40	40	40	40	40	40	[40]	40	40	80	80

12	13	14	15	16	17	18	19	20	21	22	23	mean
-10	-10	-10	-10	-10	0	10	10	10	10	0	0	0
40	50	30	30	40	40	30	40	70	60	40	30	35
50	40	50	50	50	70	70	70	50	40	40	40	42
30	30	40	40	30	50	50	70	40	40	30	30	36
-10	-10	0	10	20	20	20	30	30	20	30	40	20
40	60	40	40	60	60	60	40	40	30	30	30	-
40	40	60	40	40	-10	20	30	30	30	40	60	37
40	70	80	60	70	60	80	80	60	70	70	40	53
60	60	60	40	40	40	40	40	40	40	30	40	42
40	30	40	40	60	70	70	60	40	40	40	40	40
40	40	40	20	40	40	40	30	10	-10	-20	-10	24
40	40	30	40	40	70	60	60	40	40	30	30	27
40	40	40	30	30	30	30	40	30	40	10	10	-
30	20	30	30	30	40	30	20	10	20	30	30	24
10	0	0	0	0	-20	-40	-20	-10	40	10	0	4
20	30	0	-30	-30	-30	-10	-30	-40	-60	-40	-30	-10
-30	-70	30	70	40	40	20	90	30	40	30	10	-
20	30	30	[40]	40	40	40	40	60	40	40	40	34
60	70	60	40	60	70	80	40	40	0	0	20	44
60	80	80	80	60	90	120	110	100	90	70	60	62
60	70	60	50	70	80	90	110	100	80	70	60	63
60	30	30	-10	-20	30	30	40	10	40	30	30	41
0	30	40	40	70	80	80	60	30	30	30	20	42
70	80	70	80	80	80	80	90	100	80	50	60	55
50	50	50	50	40	50	40	50	50	50	40	40	44
20	10	-S	-S	-10	30	70	70	90	100	90	30	-
40	40	20	20	70	70	60	80	80	60	70	80	-
10	10	0	30	30	30	10	0	0	0	20	20	30
40	40	40	50	50	50	60	60	50	40	40	40	-
40	50	40	50	60	40	50	80	80	50	40	40	46
60	70	70	70	70	70	60	50	70	30	-S	OBS	-

SCHUMANN RESONANCE OBSERVATIONS

G. SÁTORI

Schumann resonances are the electromagnetic eigenmodes of the Earth-ionosphere cavity maintained by the world thunderstorm activity (Schumann 1952).

The first efforts were already made in sixties to record the variations of the natural electromagnetic energy source in the Schumann resonance (SR) frequency range. P Bencze constructed an equipment for measuring SR and reported on the first results together with A Ádám (Ádám and Bencze 1963).

The experiments were renewed in eighties to realize the continuous measurements of Schumann resonance frequencies and amplitudes. Since May of 1993, the vertical electric field component in SR frequency range between 2 and 25 Hz has regularly been measured in the Nagycenk Observatory (47.6°N, 16.7°E) using a very stable ball-antenna, a preamplifier with high input impedance and low noise, an amplifier and a personal computer with high speed, multi-channel AD-converter. The complex demodulation as a spectral technique has been applied for the quasi-continuous determination of the actual peak-frequencies and the corresponding amplitudes of the first three SR modes (Sátori et al. 1996).

Using convolution filters the phase-variations of the complex wave vector relating to the central period of the filters are determined. By computing the phase changes versus time the frequency (and the amplitude) can also be monitored in time. Using this spectral technique, the frequency can be determined within a given range of frequencies, in the case applied here in the frequency range of the first three Schumann-resonance modes, namely between 7–9 Hz, 13–15 Hz and 19–21 Hz. An alternate sampling and computation process yields a quasi real-time technique.

The horizontal magnetic field components (north-south and east-west) have regularly been measured since January of 1997 using induction coils. The spectral technique is the same as in case of the vertical electric field component.

The electronics of the SR recording system was developed by J Pongrácz and J Horváth, the ball-antenna was constructed by Gy Pála.

Recording SR-transients started in the frame of US-Hungarian Joint Found (JF.554) in 1998. These events, so called Q-bursts, are excited by individual energetic lightning strokes.

The hourly averages of the peak-frequencies and the amplitudes for the first

three modes and SR transients for selected time periods (international campaigns) are available (e-mail: satori@ggki.hu). Figure 1 shows Schumann resonance recording system with the ball-antenna for the measurement of the vertical electric field component, as well as the two induction coils for the horizontal north-south and east-west magnetic field components. Figure 2, as example, exhibits the daily frequency and amplitude variations of the first three modes characteristic for a winter month. Figure 3 depicts a SR-transient.

Some results based on SR observations

The observation of Schumann resonances is important from the point of view of the world thunderstorm activity in the troposphere, as well as the different emissions (red sprite, blue jet, elves) induced by lightning strokes and large scale influences of extraterrestrial origin in the lowest ionosphere.

The semiannual variations of SR amplitudes measured at the Nagycenk Observatory, Central Europe, are the manifestation of the semiannual variation of the surface air temperature in the tropical continental regions (Sátori and Zieger 1996). The latter is due to the semiannual wave of solar insolation with maxima at the equinoxes. The magnitude of the semiannual temperature variation is about 1.5–2.0 °C. The high significance level of the semiannual variation of the SR amplitudes at Nagycenk shows that the quality of this SR data set makes it suitable for detecting temperature variations at the level of some tenths of a degree centigrade. In this way, the observation of the SR amplitudes/intensities have great importance from the point of view of global climatic changes.

Parameters of global thunderstorm activity were deduced from the long term Schumann resonance records at Nagycenk (Nickolaenko et al. 1998).

The ENSO (El Niño Southern Oscillation) phenomenon is among others characterized by sea surface temperature anomaly in the equatorial Pacific which can affect weather patterns around the world. A meridional redistribution of the world thunderstorm activity was deduced from the variations of SR frequencies on the ENSO time scale observed at Nagycenk (Sátori and Zieger 1999).

Lightning properties of the two tropical continental chimneys, the Congo and Amazon basins were compared based on Schumann resonance measurements at Nagycenk, Hungary and Rhode Island, USA and satellite observations (Williams and Sátori 2004).

See CD (program Seenck.exe, menu item SchumannRes).

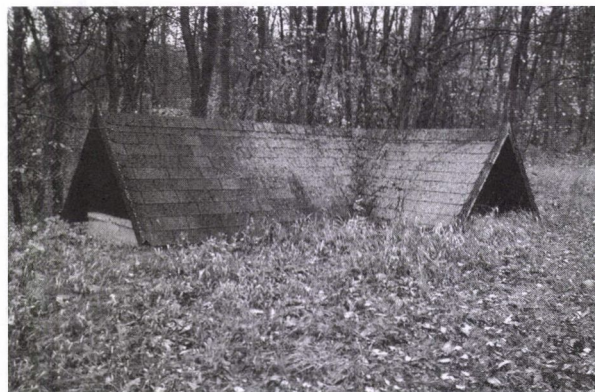
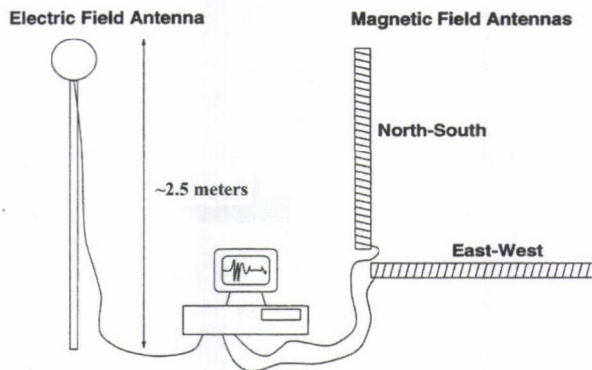


Fig. 1. Schumann resonance recording system: ball-antenna (top left), block diagram of the measurement (top middle), induction coils (top right), data acquisition system (bottom left), hut for the induction coils (bottom right)

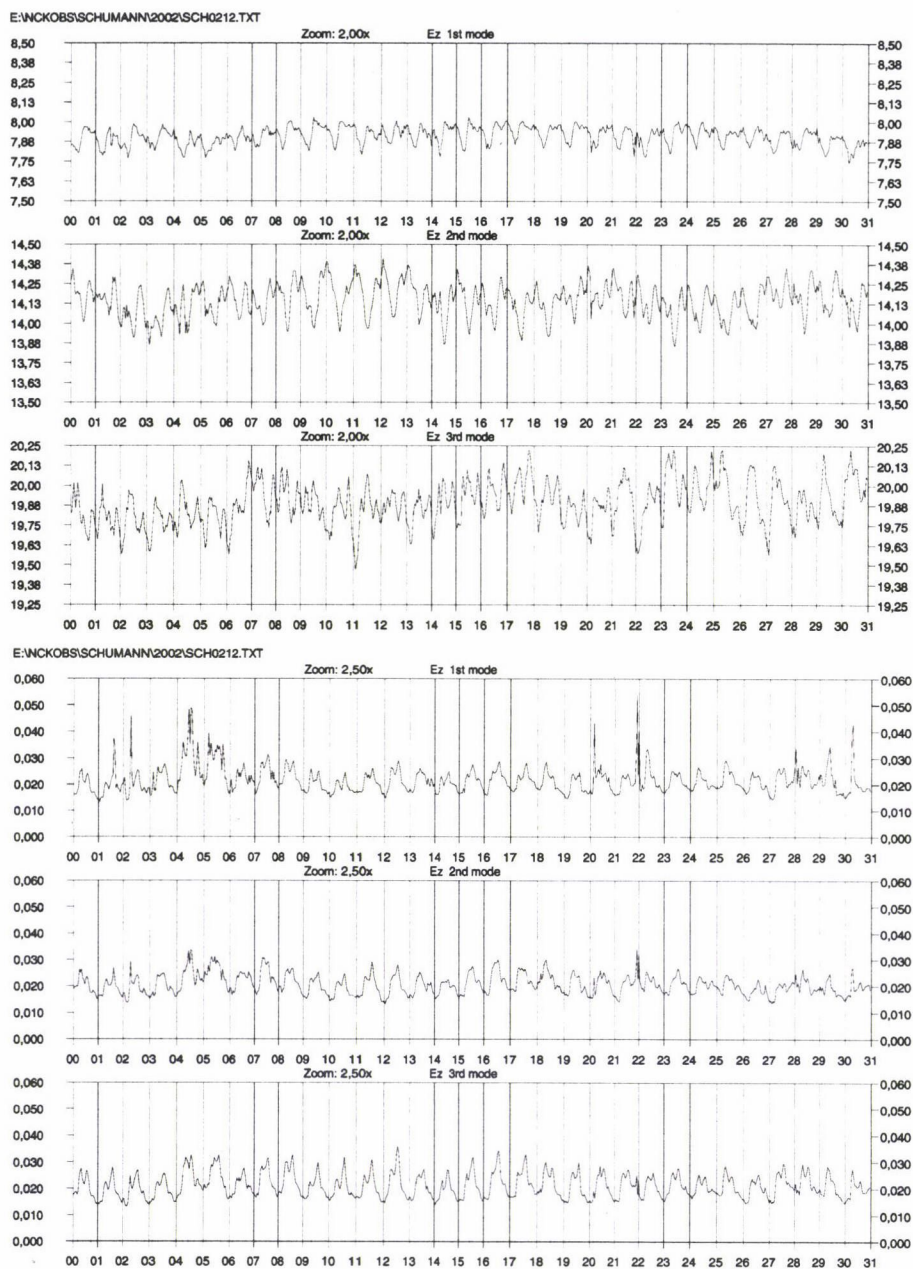


Fig. 2. Hourly means of SR frequencies in Ez (top) and relative amplitudes in V (bottom) measured for the first three modes in the days of December, 2002

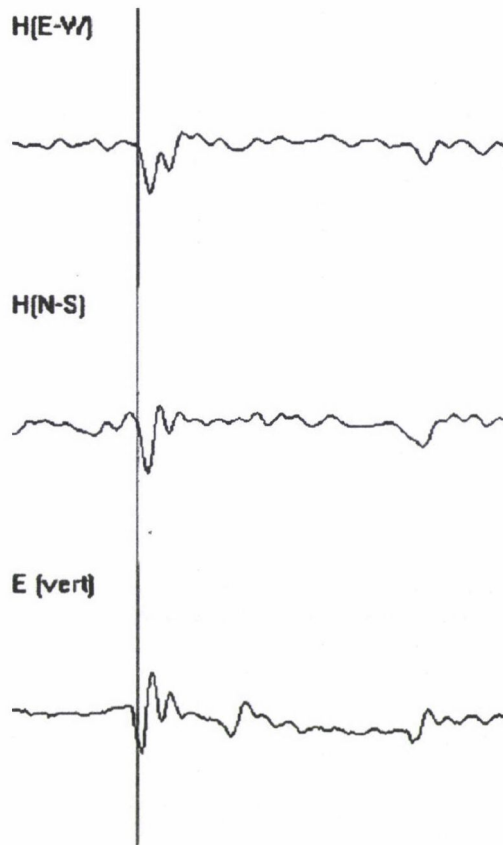


Fig. 3. SR-transient recorded at Nagycenk. Time markers include intervals of 100 ms. The horizontal broken lines indicate the trigger level of ± 0.6 V

References

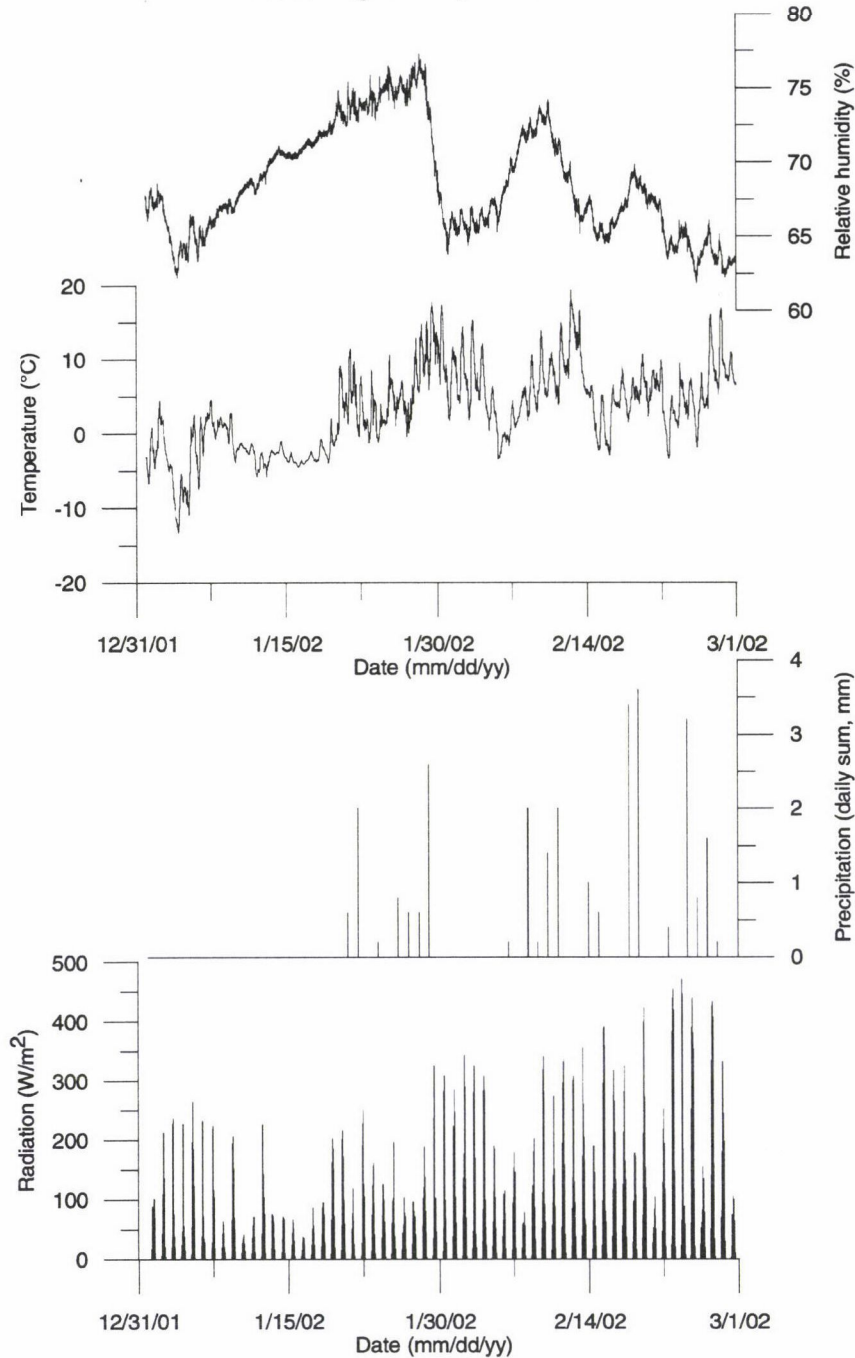
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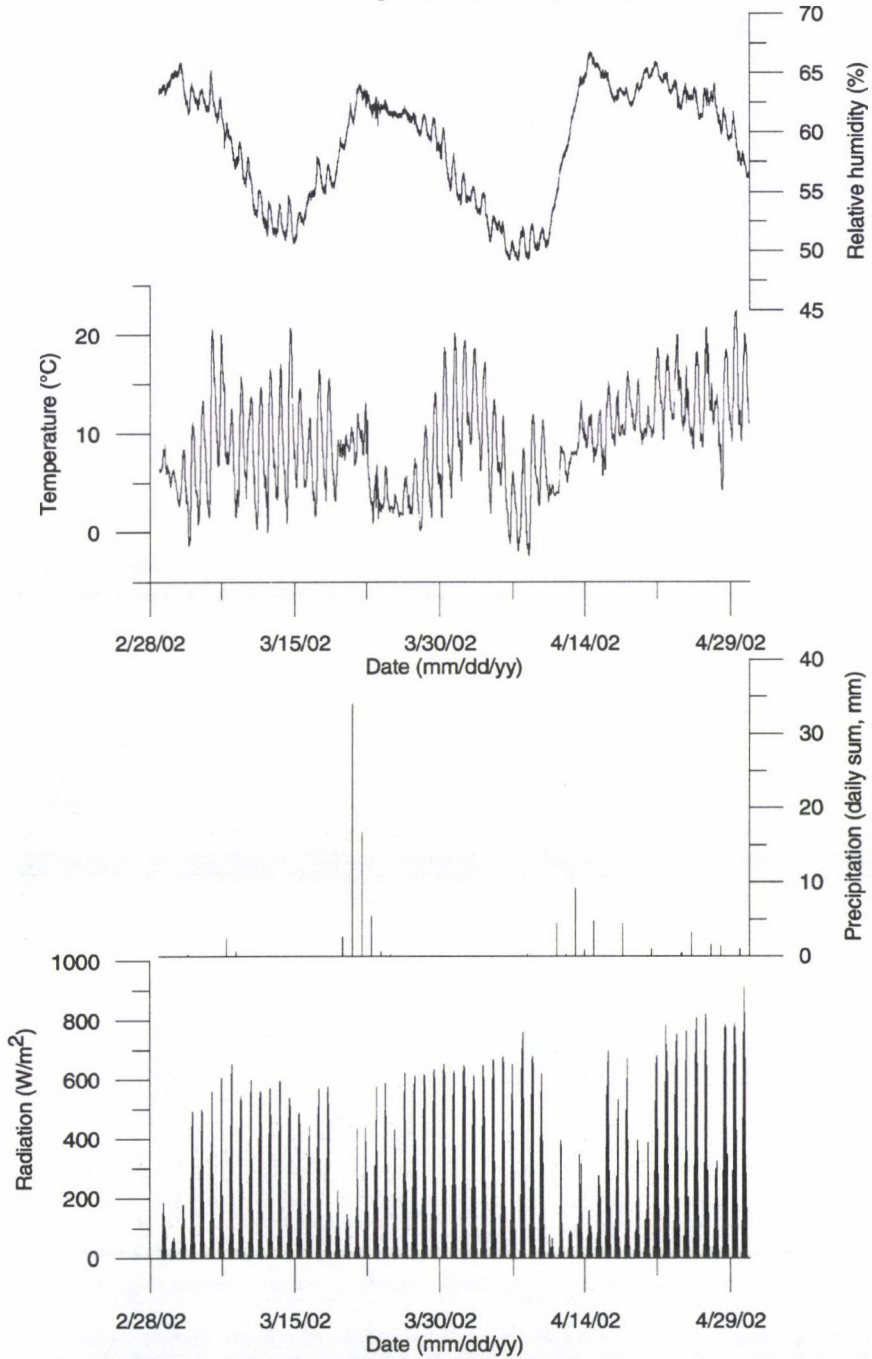
IV. METEOROLOGICAL OBSERVATIONS

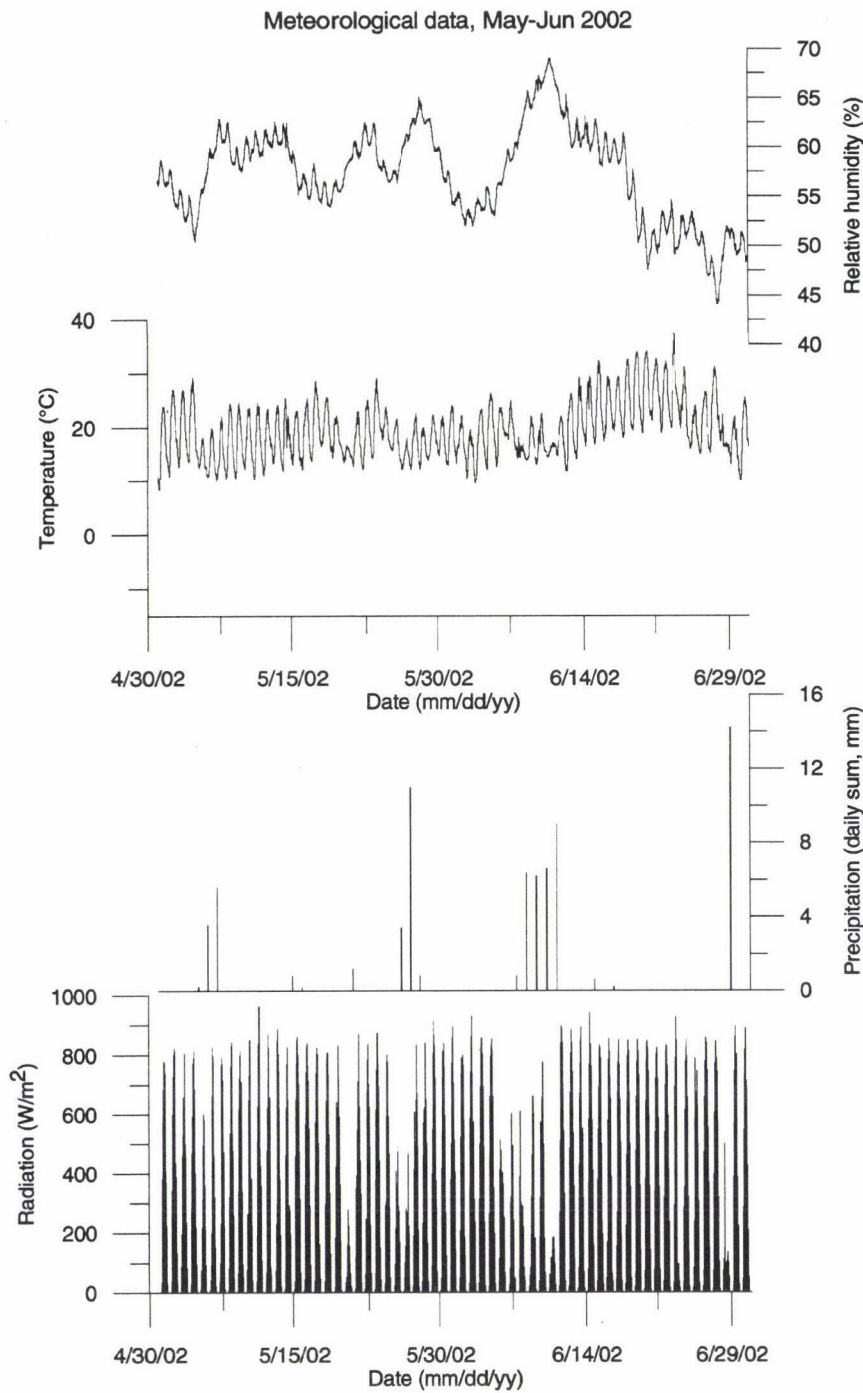
2002-2004

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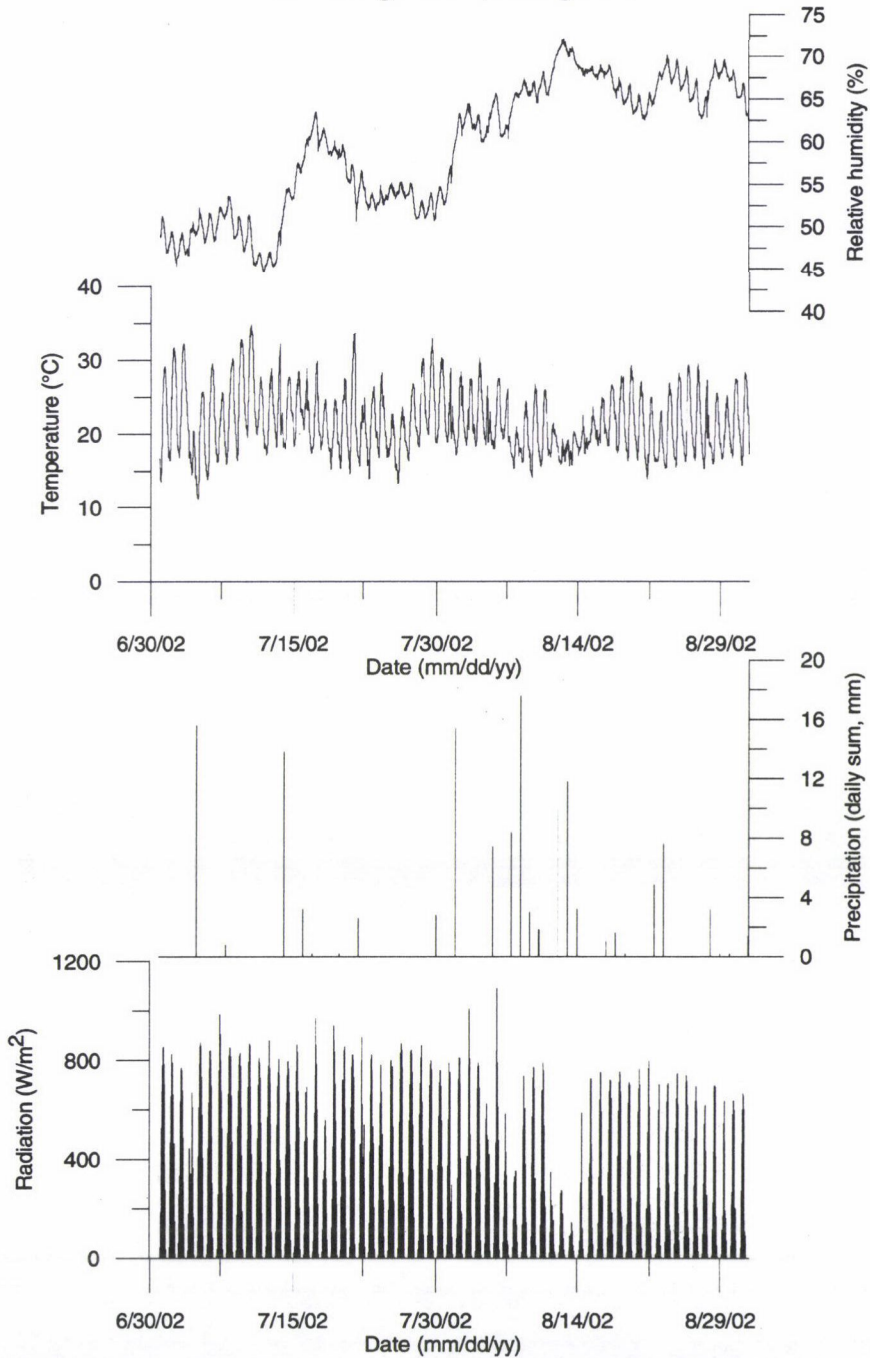


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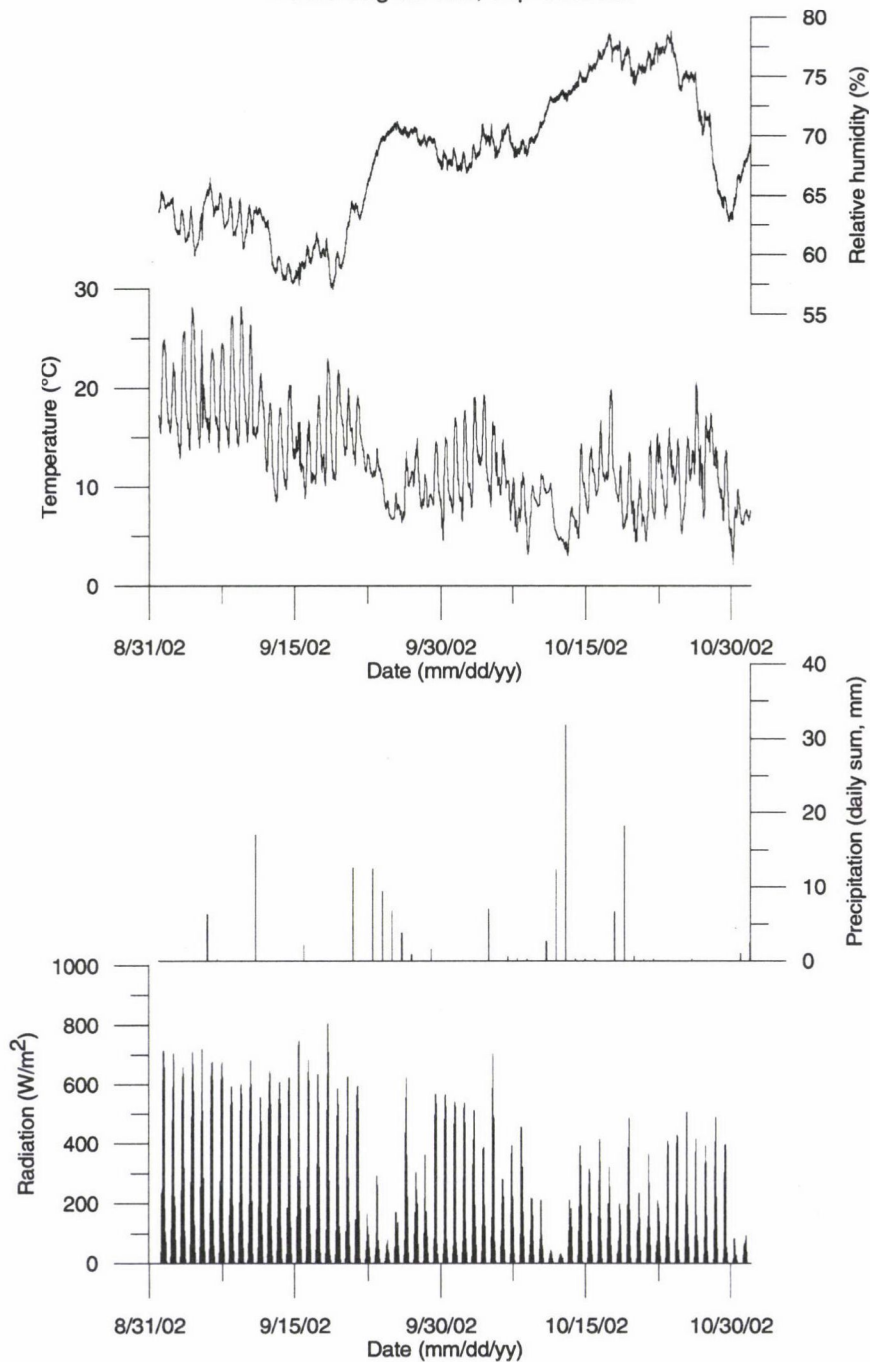




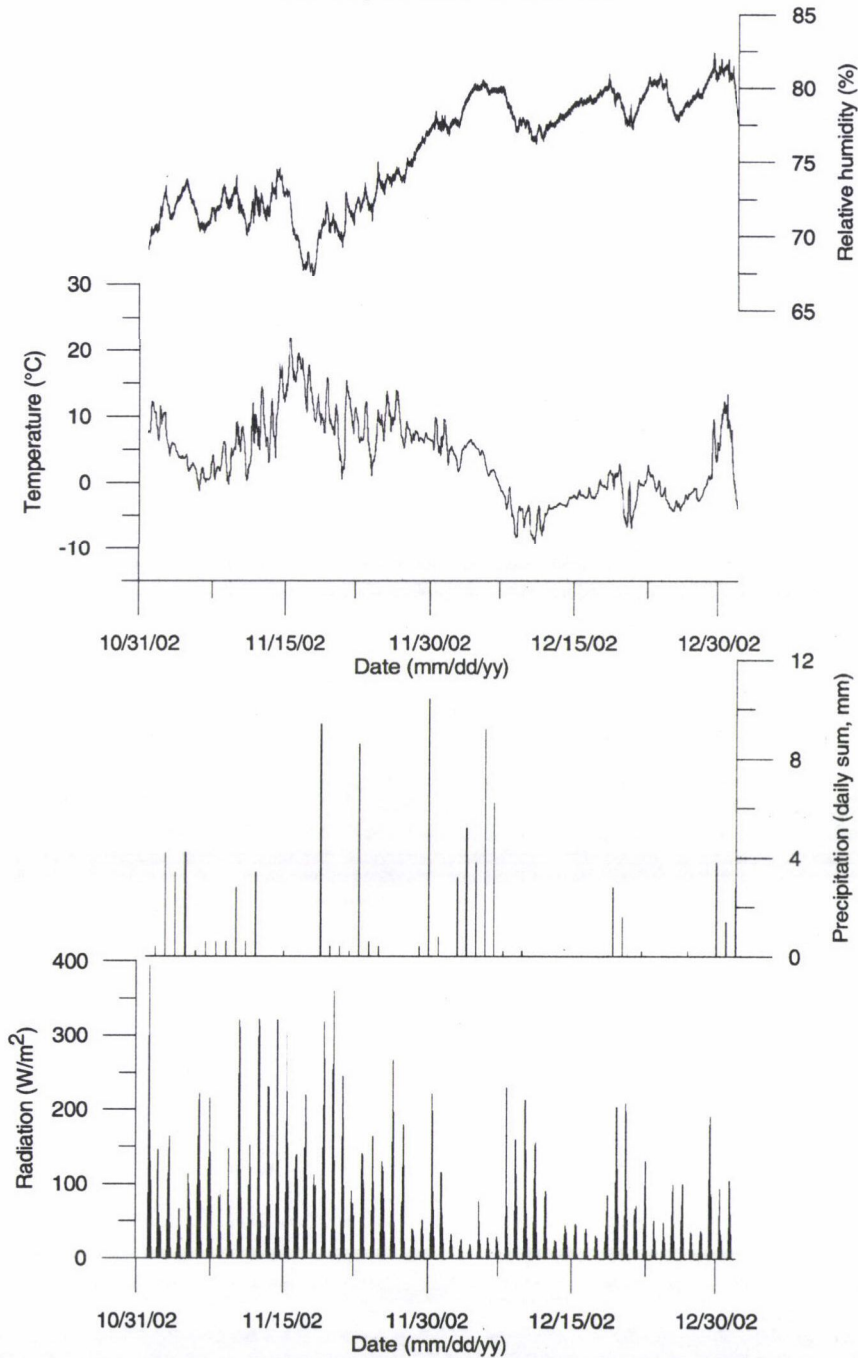
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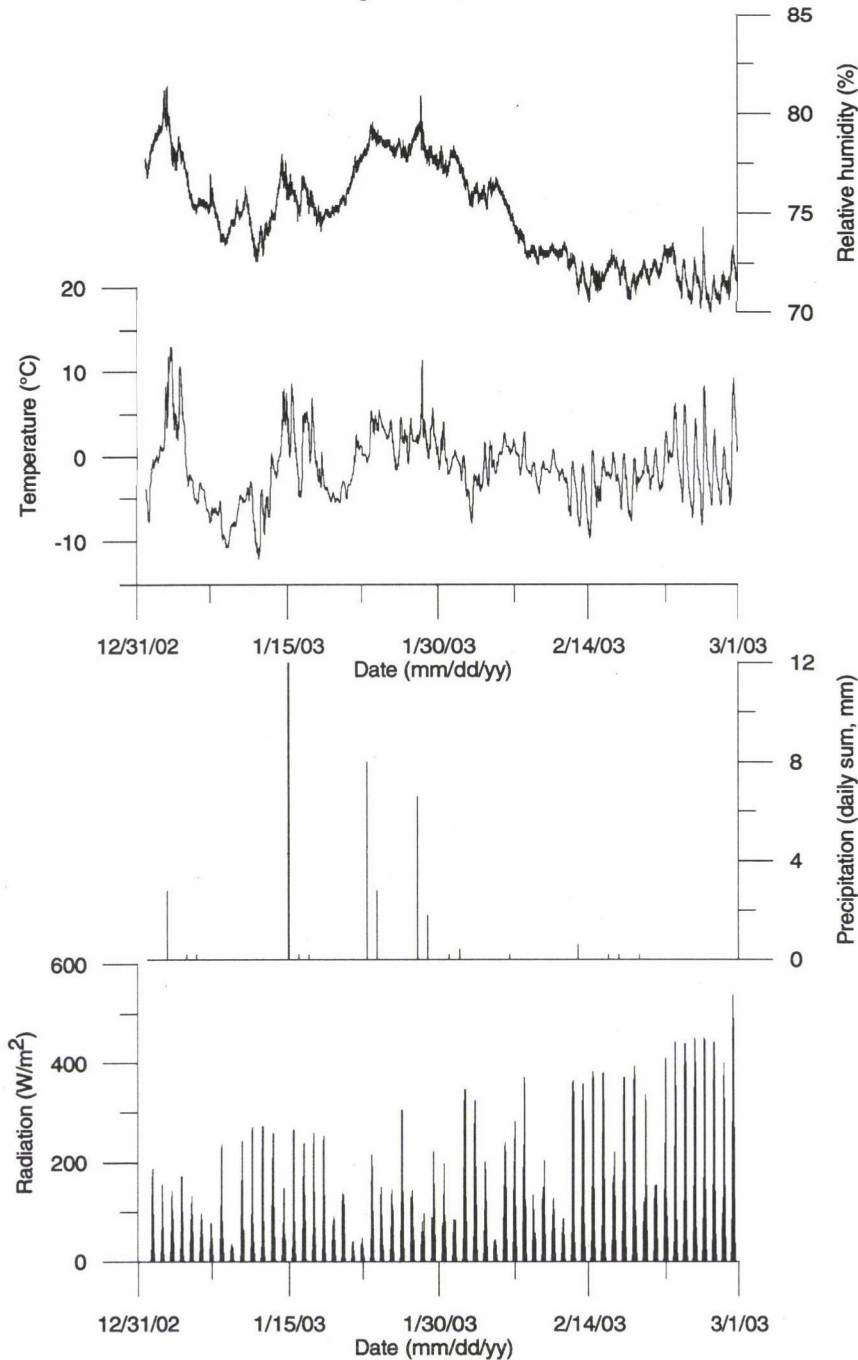
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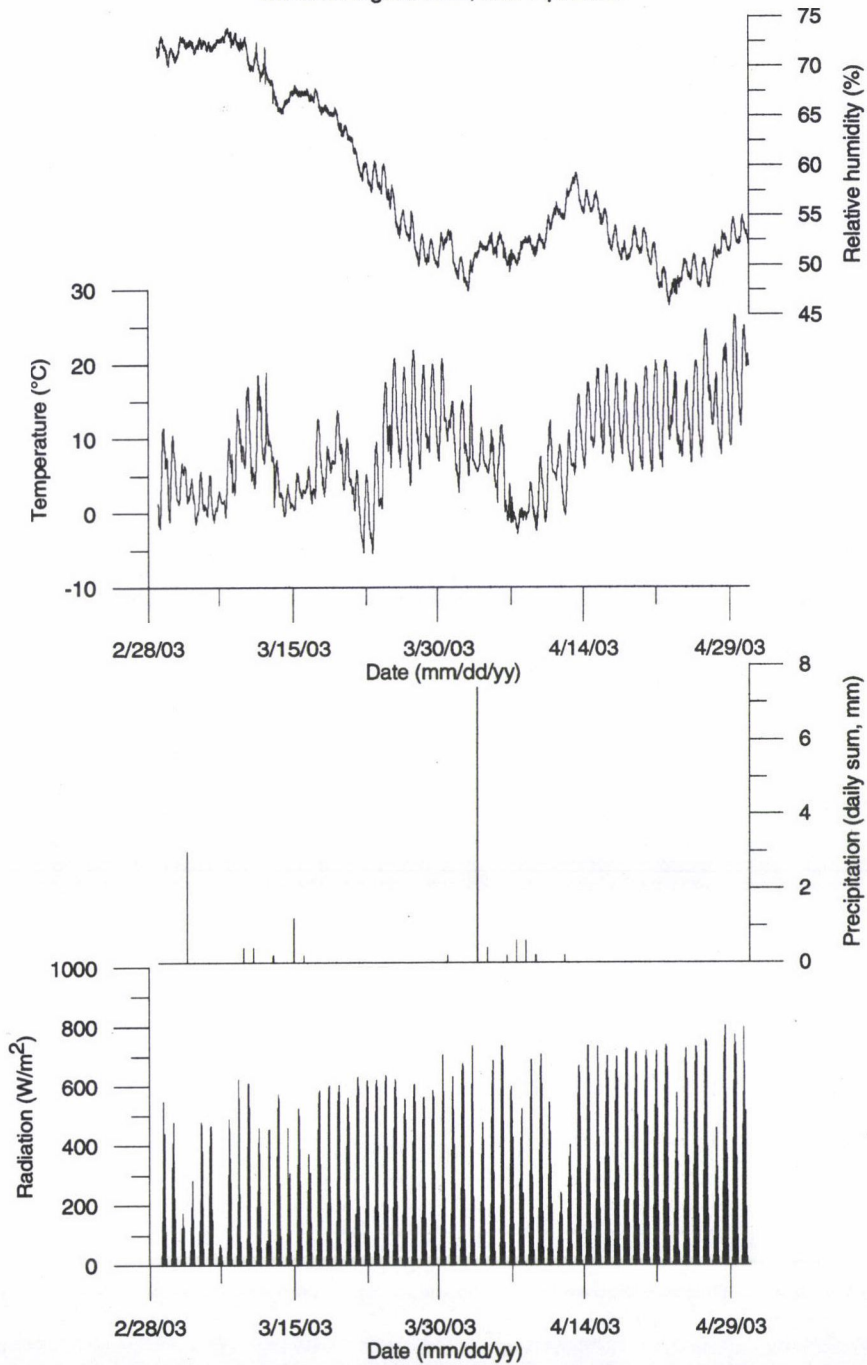
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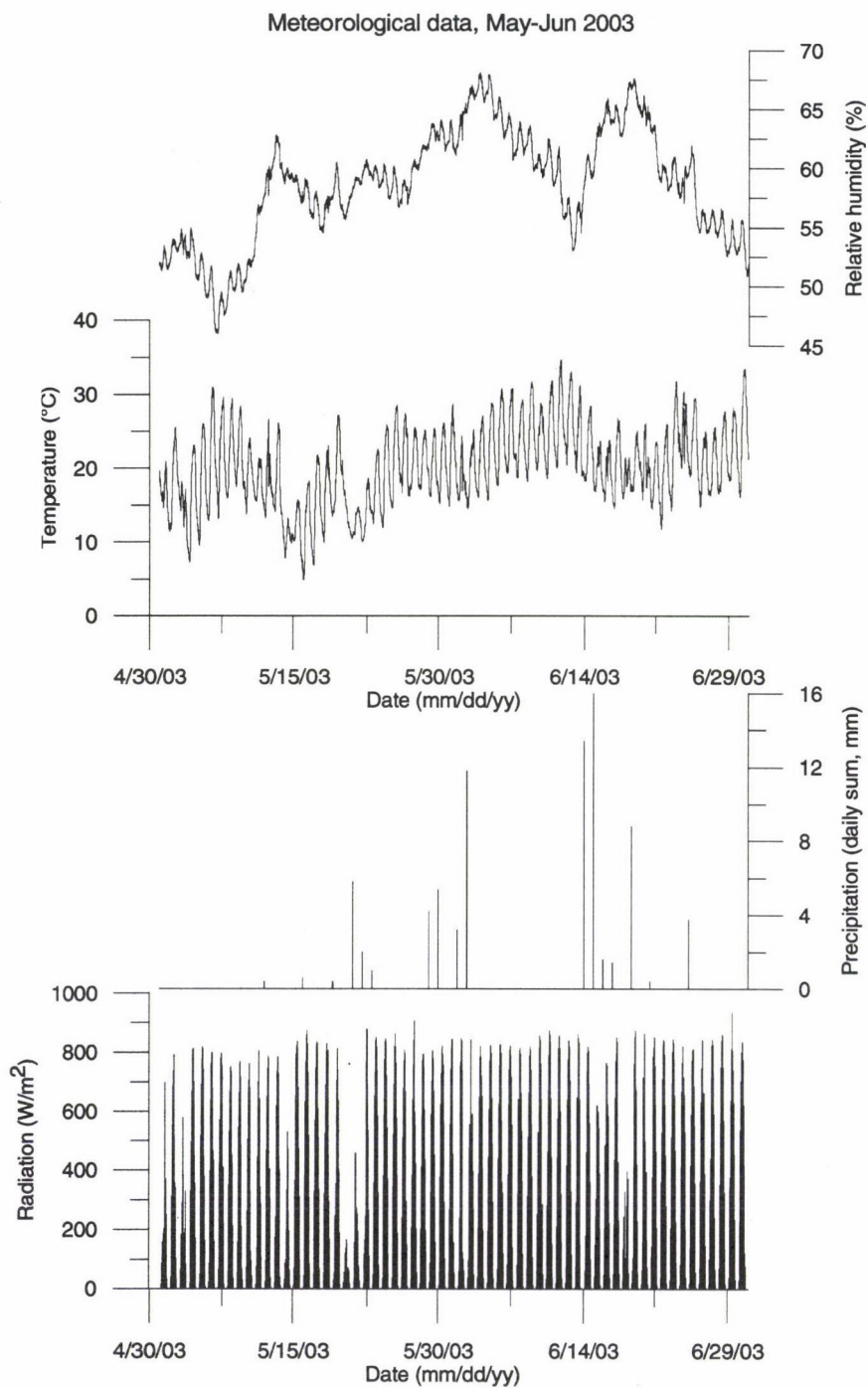


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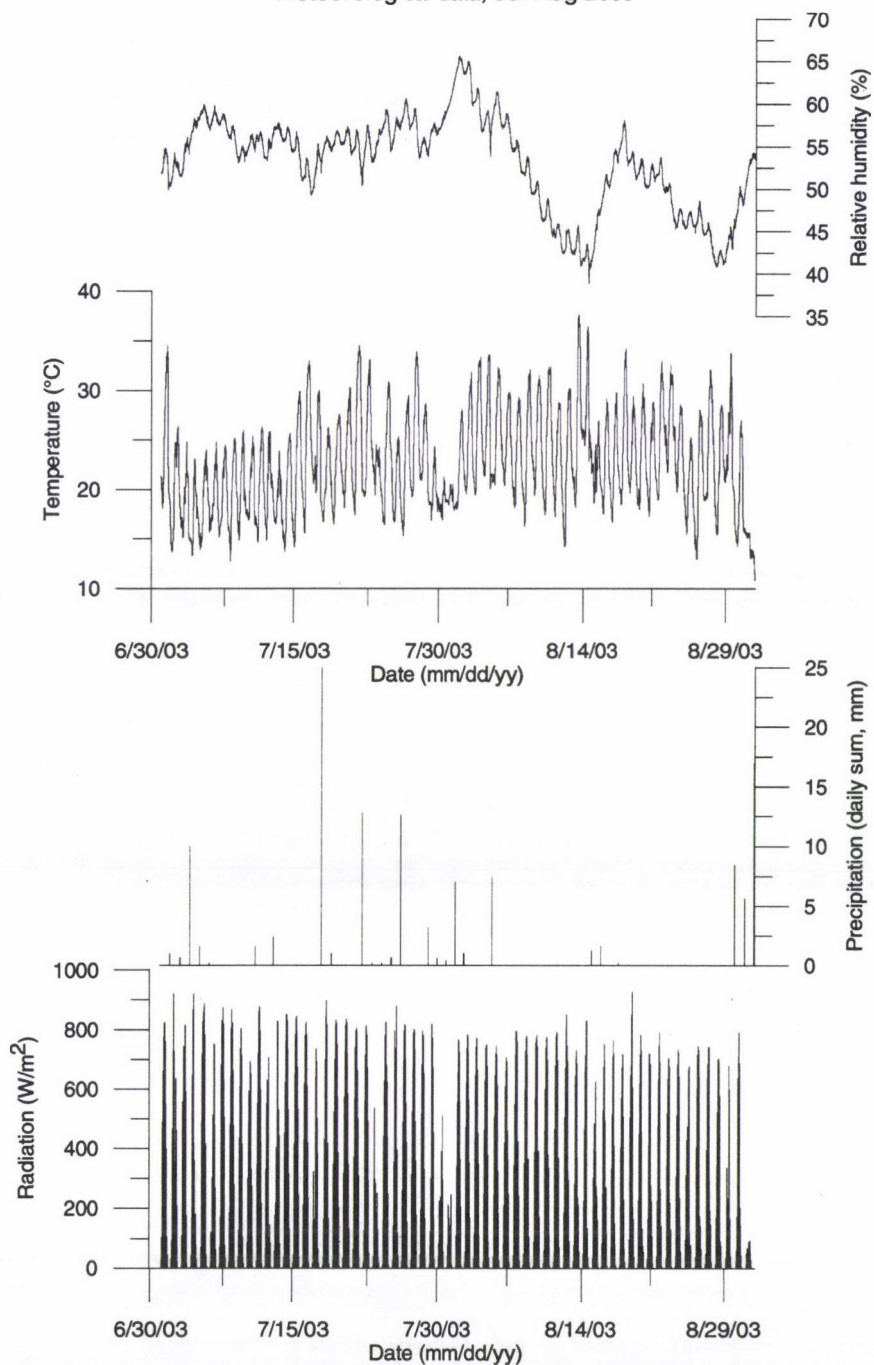


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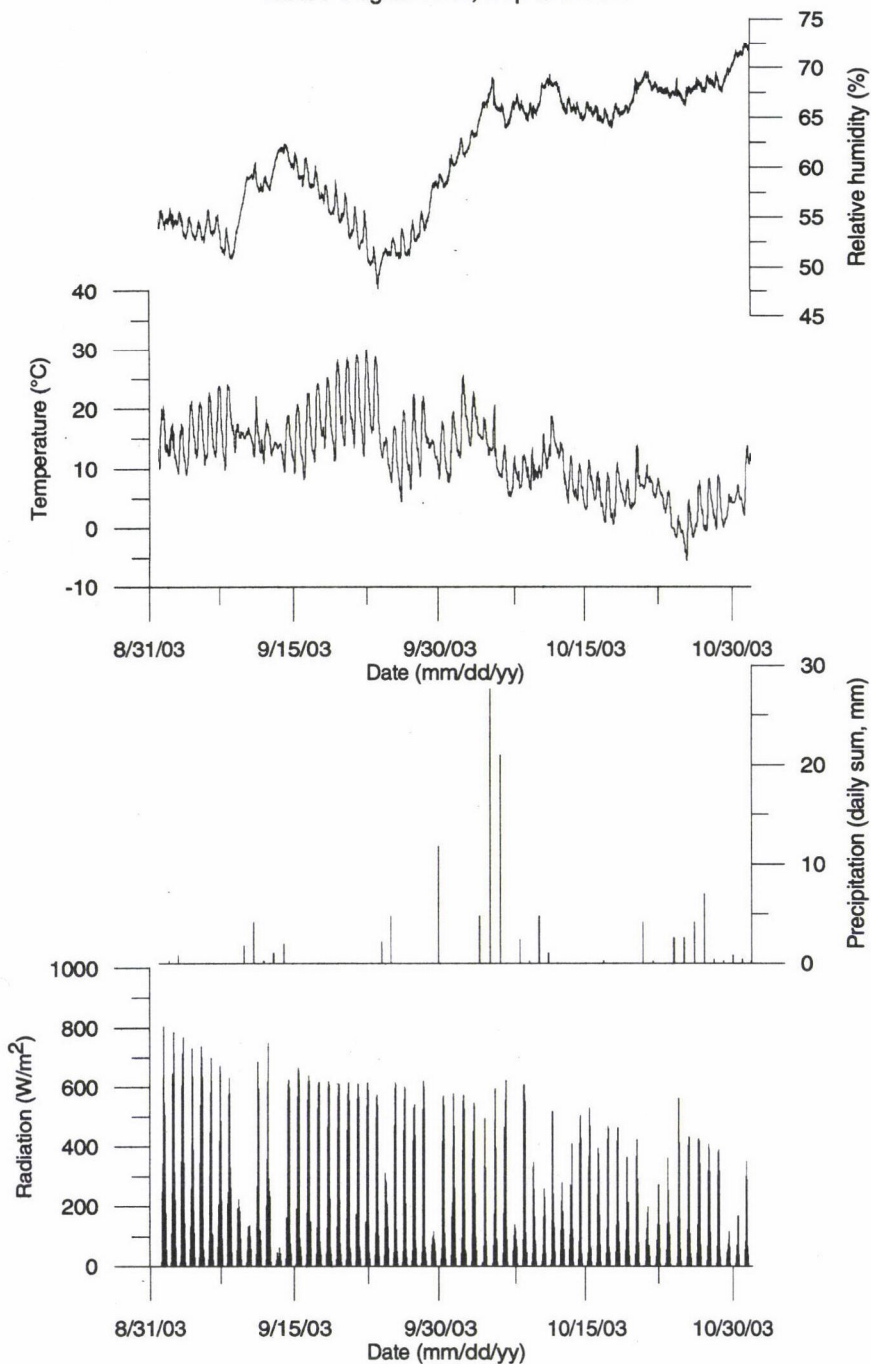




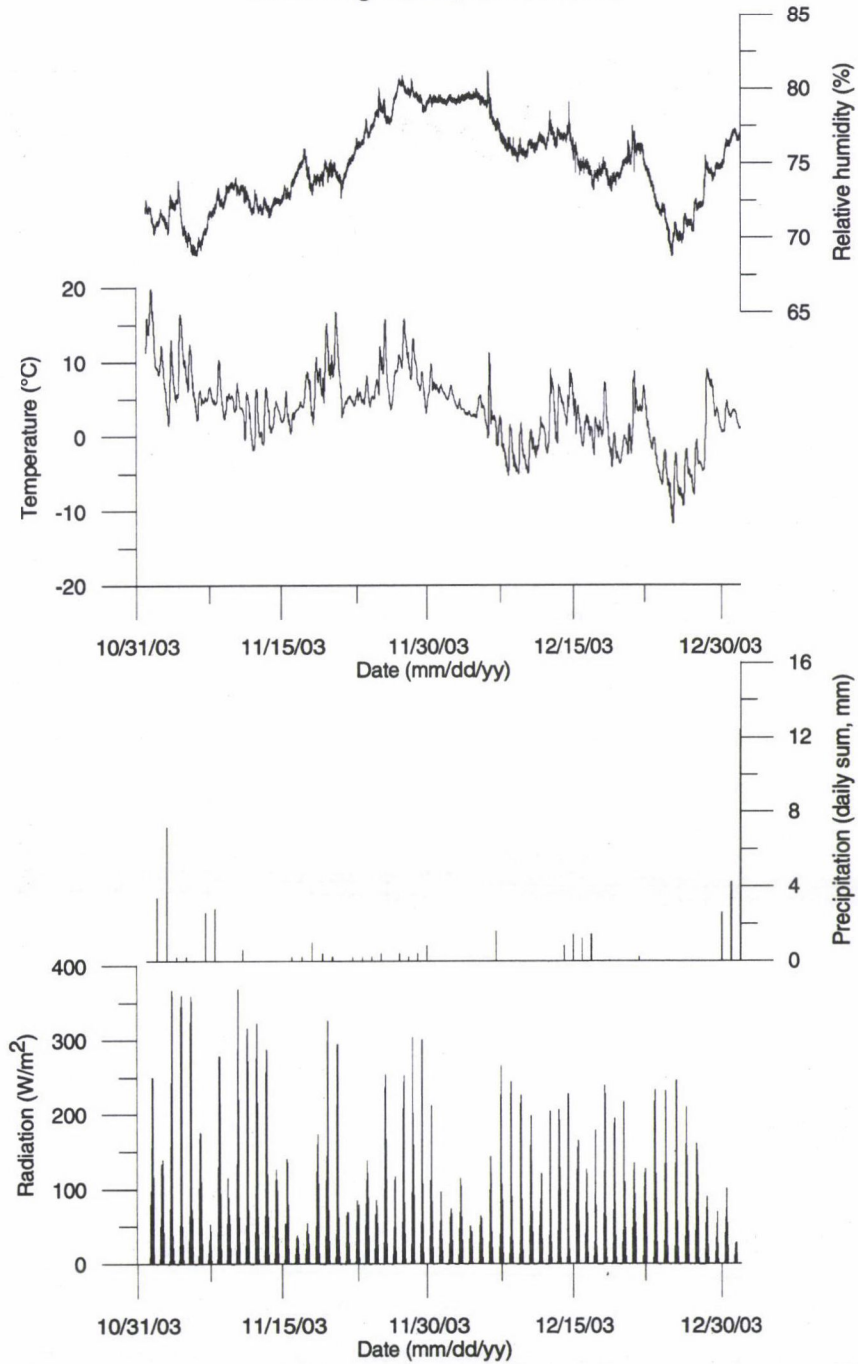
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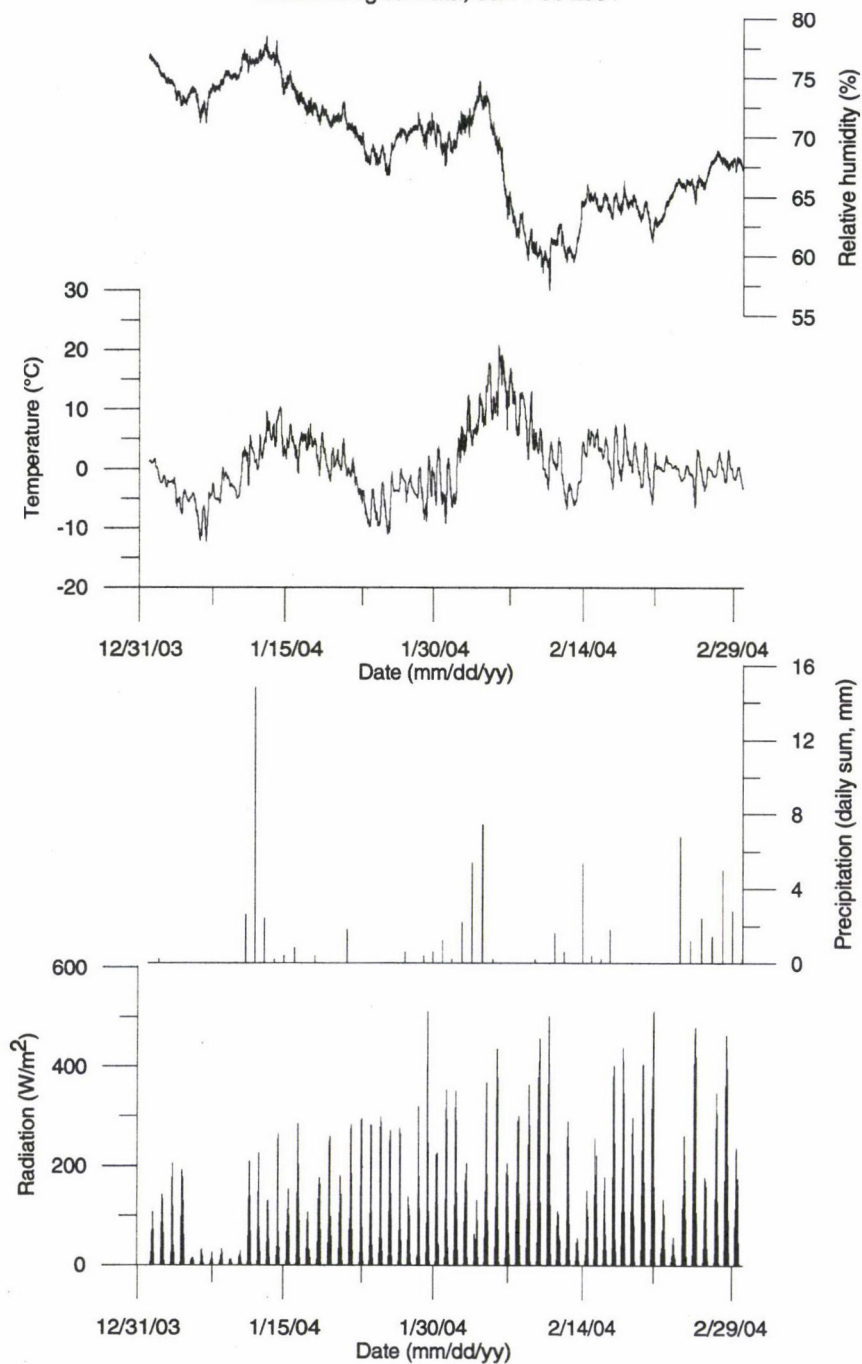
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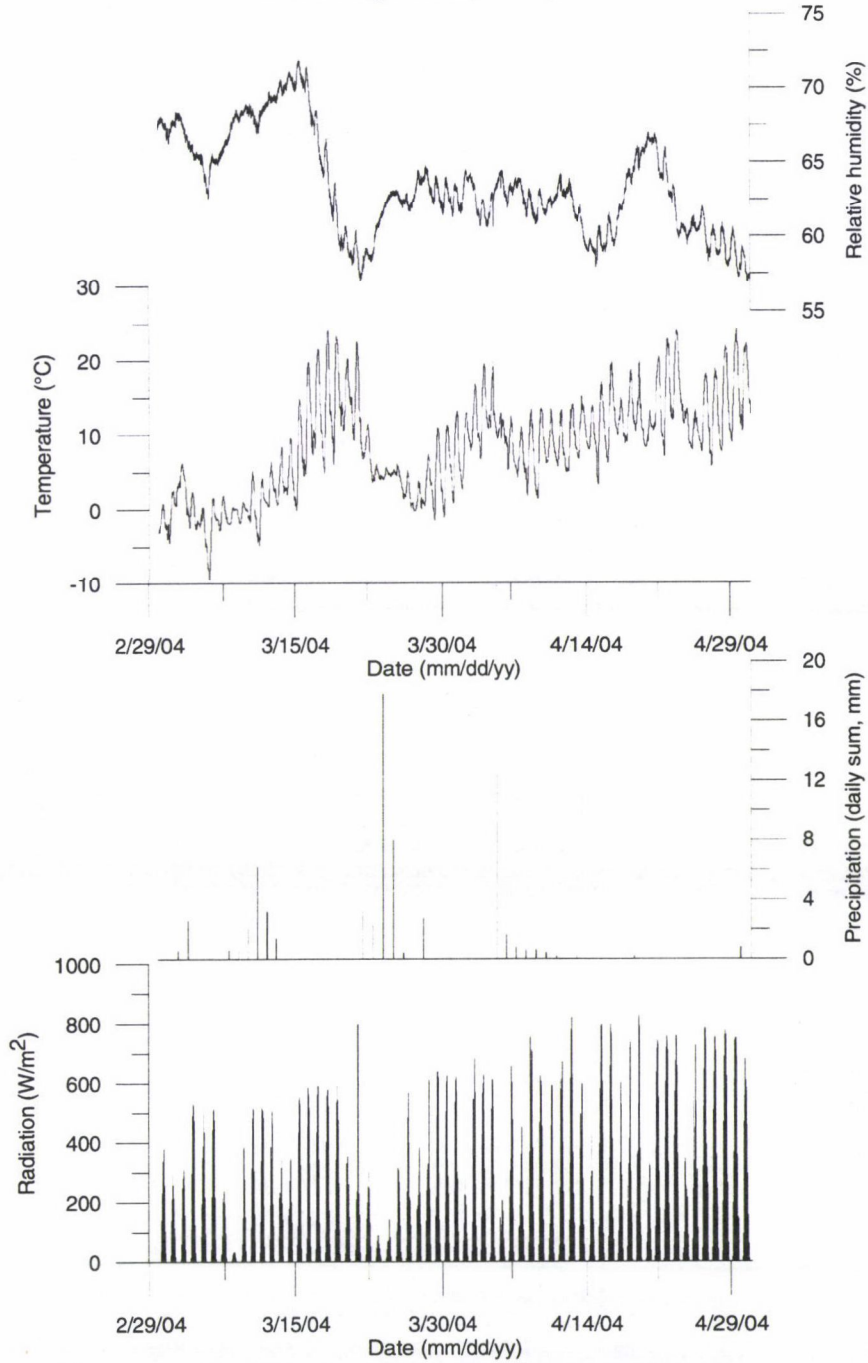
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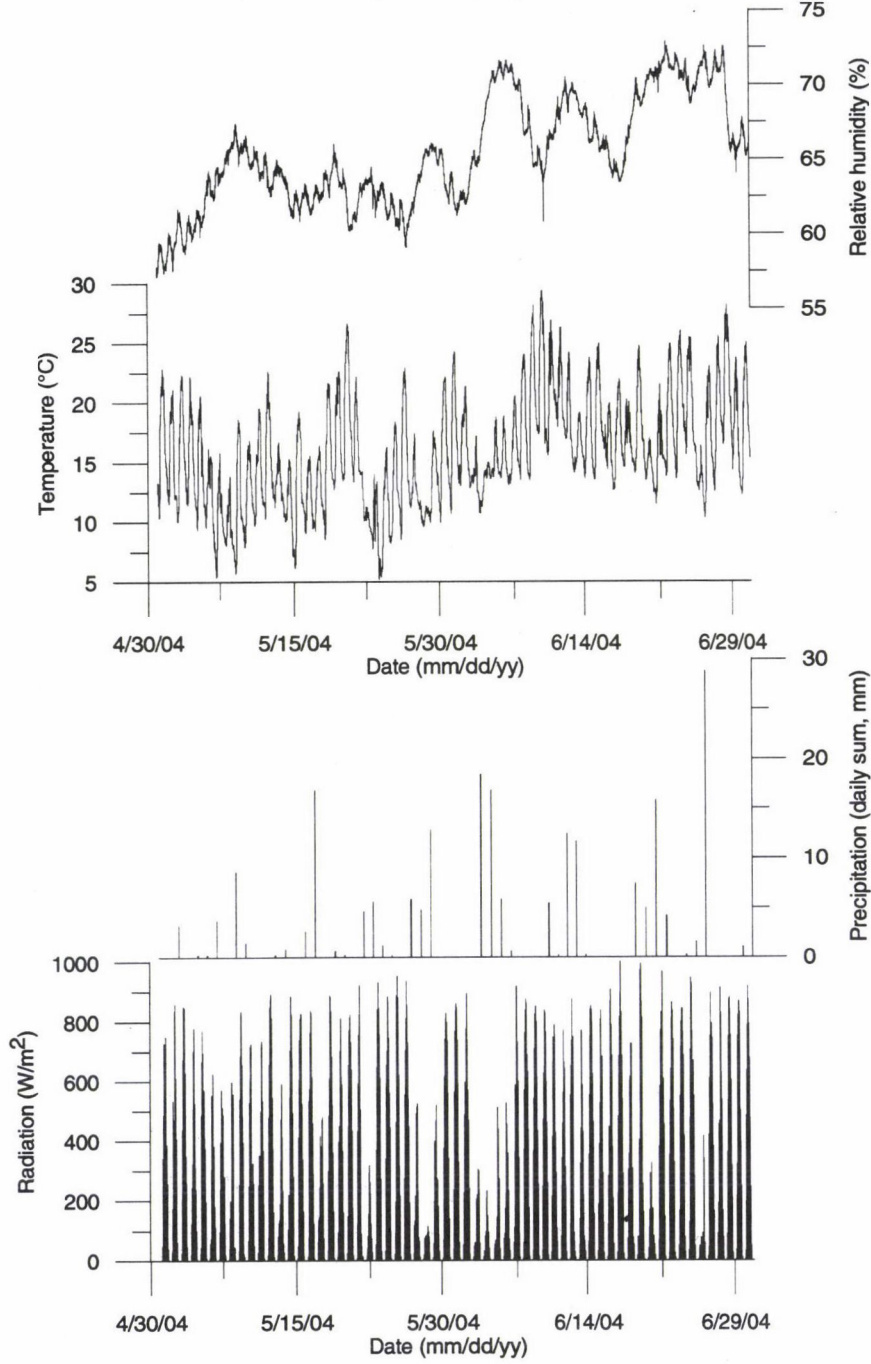
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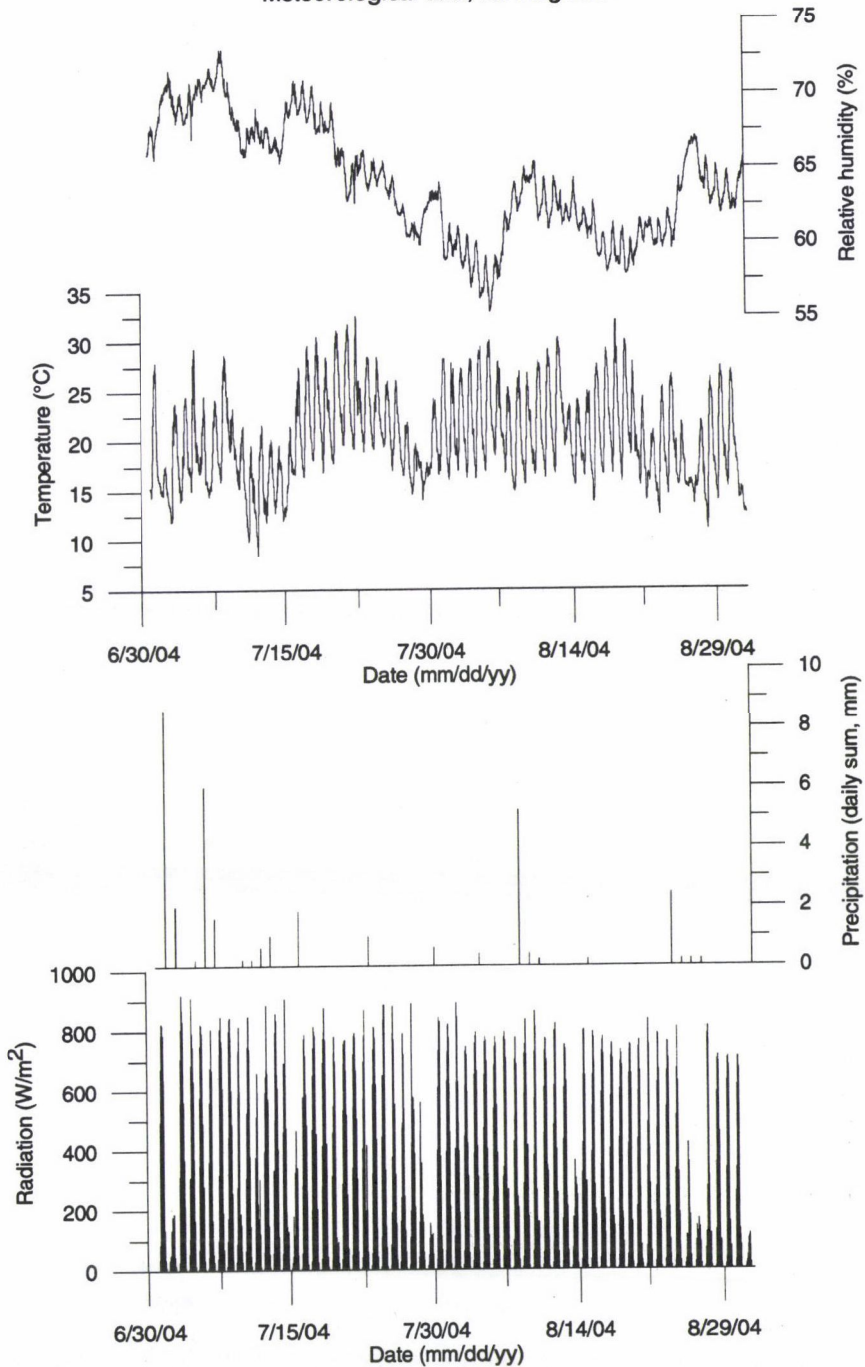
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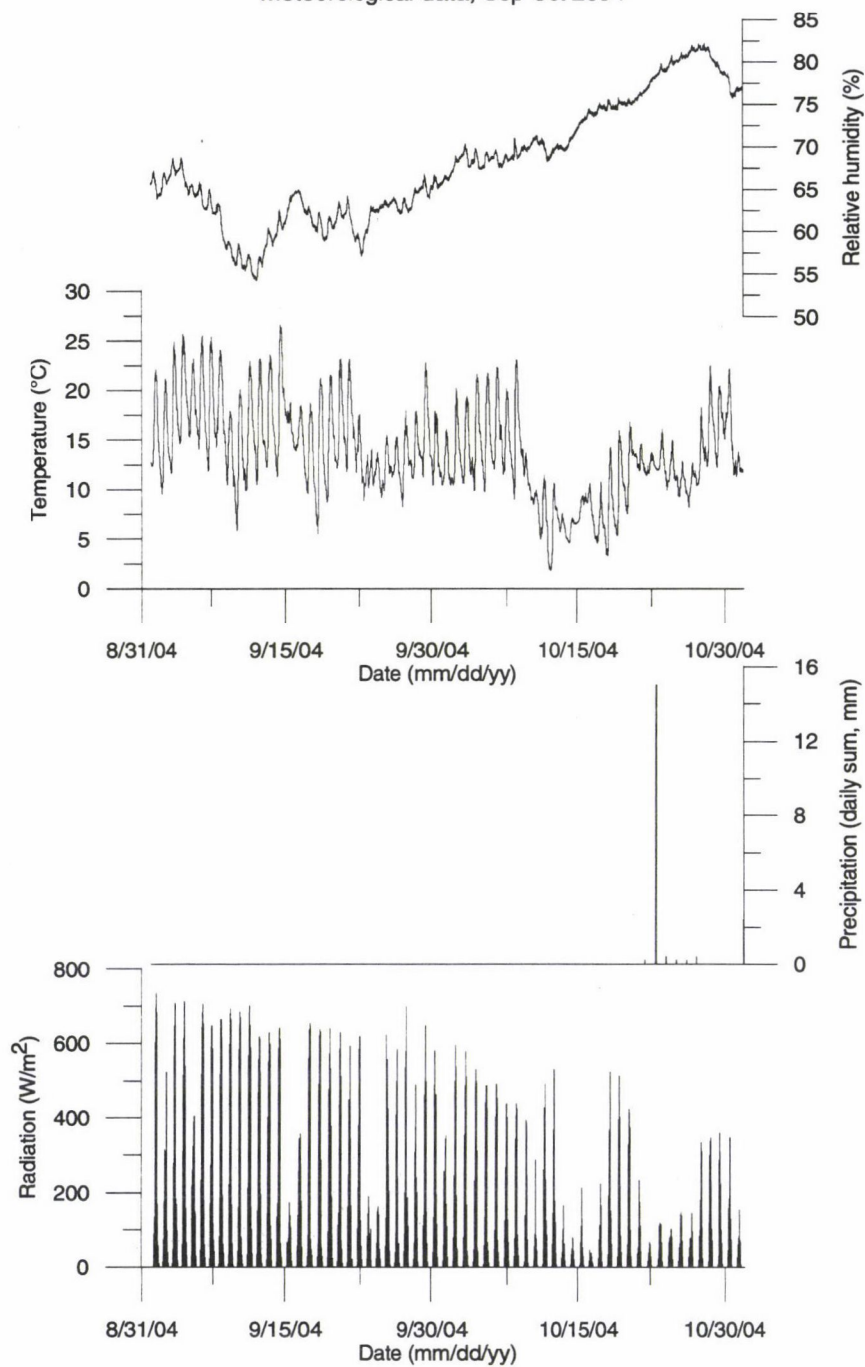
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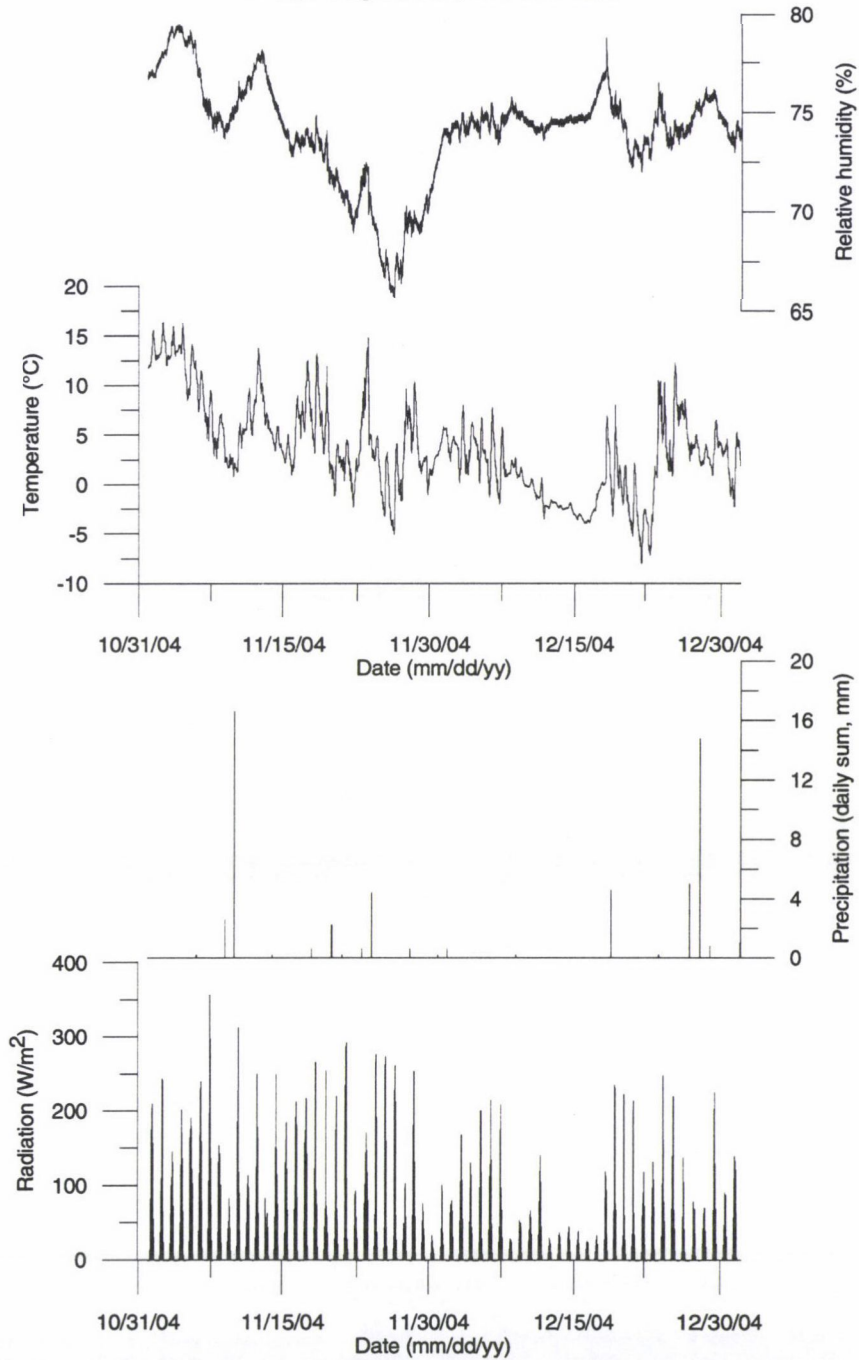
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Meteorological data, Sep-Oct 2004



Meteorological data, Nov-Dec 2004



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